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BASELINE FUEL ECONOMY AND EMISSIONS TESTS OF A CHRYSLER 1978, 225CID ENGINE

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16. Abstract

This document reports on baseline engine tests of a Chrysler 1978, 225 CID, six-cylinder engine. The tests were conducted in the Automotive Research Laboratory at the Transportation Systems Center. Test results presented herein are also filed on computer-based tapes (9-track ASC II) and are available from the National Technical Information Services (NTIS).

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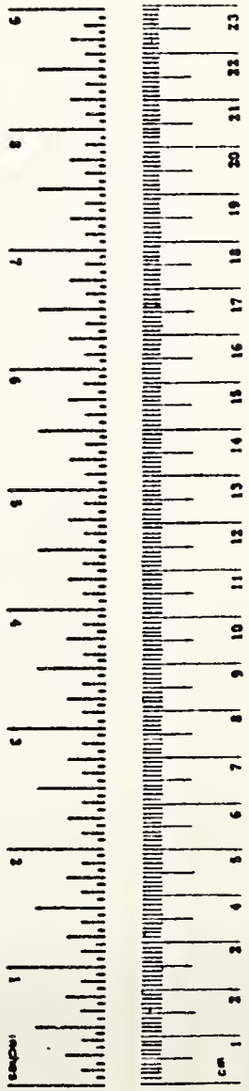
PREFACE

This report presents the baseline, steady-state test results of a 1978 Chrysler 225 CID engine. This work was performed in the Automotive Research Laboratory at the Transportation Systems Center of the U.S. Department of Transportation. This work is in support of the Automotive Fuel Economy Research and Analysis Support Program for NHTSA's Technology Assessment Division, Office of Passenger Vehicle Research. The authors gratefully acknowledge the technical support of Ralph Colello, Dr. Thomas Trella, Russell Zub, and Norman Deserres.

METRIC CONVERSION FACTORS

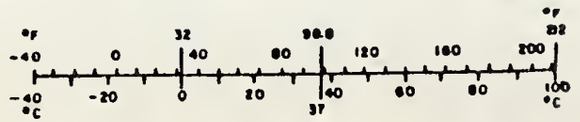
Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	square centimeters	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
		MASS (weight)		
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
		VOLUME		
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
		TEMPERATURE (exact)		
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
		AREA		
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
		MASS (weight)		
g	grams	0.036	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
		VOLUME		
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
		TEMPERATURE (exact)		
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



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1. INTRODUCTION

The work reported details the results of baseline, steady-state testing of a 1978 Chrysler, 6-cylinder, 225 CID engine. These tests measured the fuel rate and gaseous emissions while the engine was operated on a dynamometer at 57 speed/load points.

The objectives of this engine test are as follows:

- o Characterize the fuel economy and emissions of present and prototype automotive engines;
- o Provide an independent data base for vehicle performance modeling and fuel economy assessment.

2. EXPERIMENTAL DESIGN

This section briefly reviews the test design and highlights salient features of the Chrysler 225 CID baseline testing.

2.1 ENGINE

The manufacturers specifications for the Chrysler 225 CID engine are given in Table 1.

TABLE 1. ENGINE CHARACTERISTICS

Model Year	1978
Manufacturer	Chrysler Corp.
No. of cylinders	6
Displacement	225 CID (3.7L)
Bore	3.40 inches (86 mm)
Stroke	4.125 inches (105 mm)
Compression ratio	8.4 to 1
Max. Rated HP	109 @ 3600 rpm
Max. Rated Torque	182 @ 2000 rpm
Calibration	49 State, automatic
Transmission type	automatic
Engine weight*	564 lbs (256 kg)

This mean-tolerance engine was broken-in with the test schedule shown in Table 2. The engine came equipped with an oxidation catalyst and Exhaust Gas Recirculation (EGR) for emission control. The engine was equipped with a manual transmission flywheel for mounting to the dynamometer.

*Includes starter, alternator, fan, manual transmission flywheel, bell housing, wire harness, battery cables, vacuum lines, air inlet system. Does not include radiator, water hoses, exhaust pipes, muffler, engine coolant, oil.

TABLE 2. CHRYSLER 225 CID ENGINE BREAK-IN SCHEDULE

Period (hr)	Speed (rpm)	Torque (lb-ft)
1	1200	64.0
1	1600	94.5
1	2000	108.5
2	2400	122.5
2	2800	133.0
2	3200	136.5
2	3600	138.3(1)
2	4000	WOT (1)
1/2	4400	WOT (2)

(1) Cycle 4 min. at load, 1 min. at 1600 rpm no load
(2) Check wide-open throttle (WOT) friction from 4400 rpm down

A single batch of unleaded Indolene test fuel was used for engine break-in and testing. The gasoline specifications are shown in Table 3.

TABLE 3. FUEL SPECIFICATIONS

Amoco Unleaded Indolene
Specific Gravity ... 0.7455@60°F
Percent Carbon... 83.39
Percent Hydrogen... 12.93
H/C Atomic ratio... 1.85
Upper heating value... 19,733 BTU/lb

2.2 TEST CONFIGURATION

The engine was installed in the Automotive Research Laboratory test cell No. 2. This cell has a DC, programmable dynamometer for power absorption and motoring tests. Figures 1 and 2 show the electronic and fluid - flow configurations for the engine mounted in the cell for testing. Figure 3 is an illustration of the engine installed in the cell.

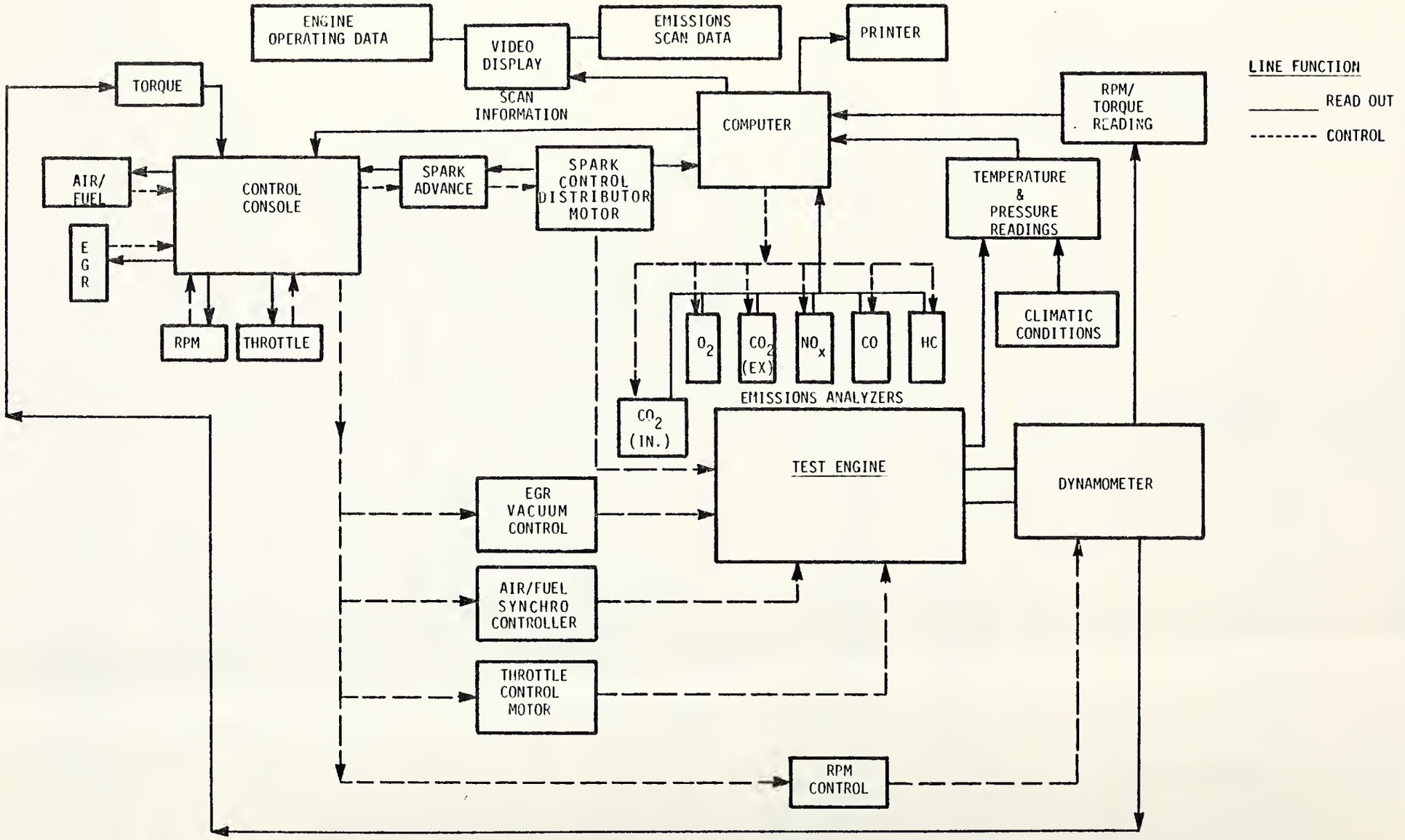

FIGURE 1. ELECTRONIC FLOW DIAGRAM

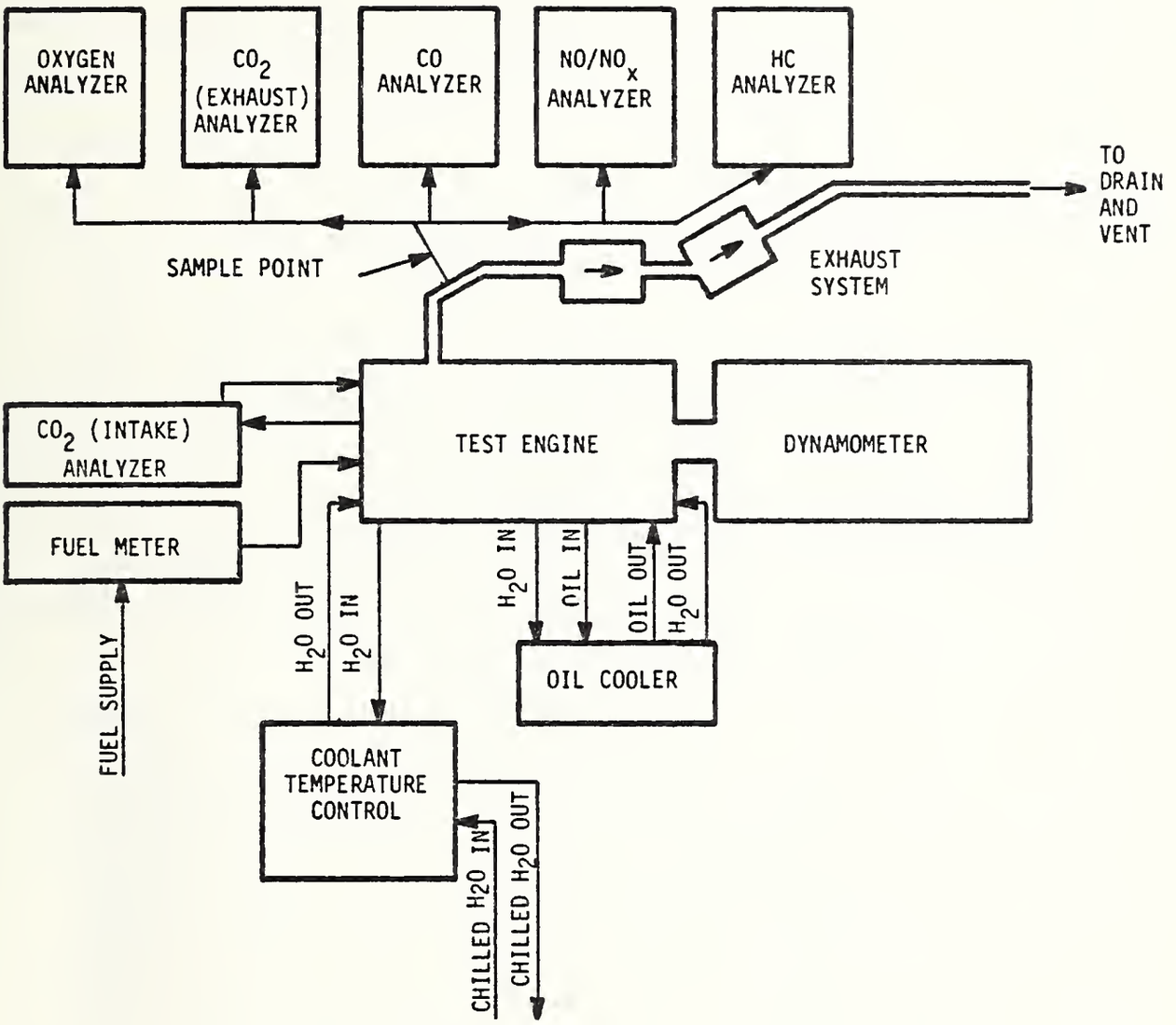

FIGURE 2. CELL NO. 2 TEST ENGINE FLUID FLOW

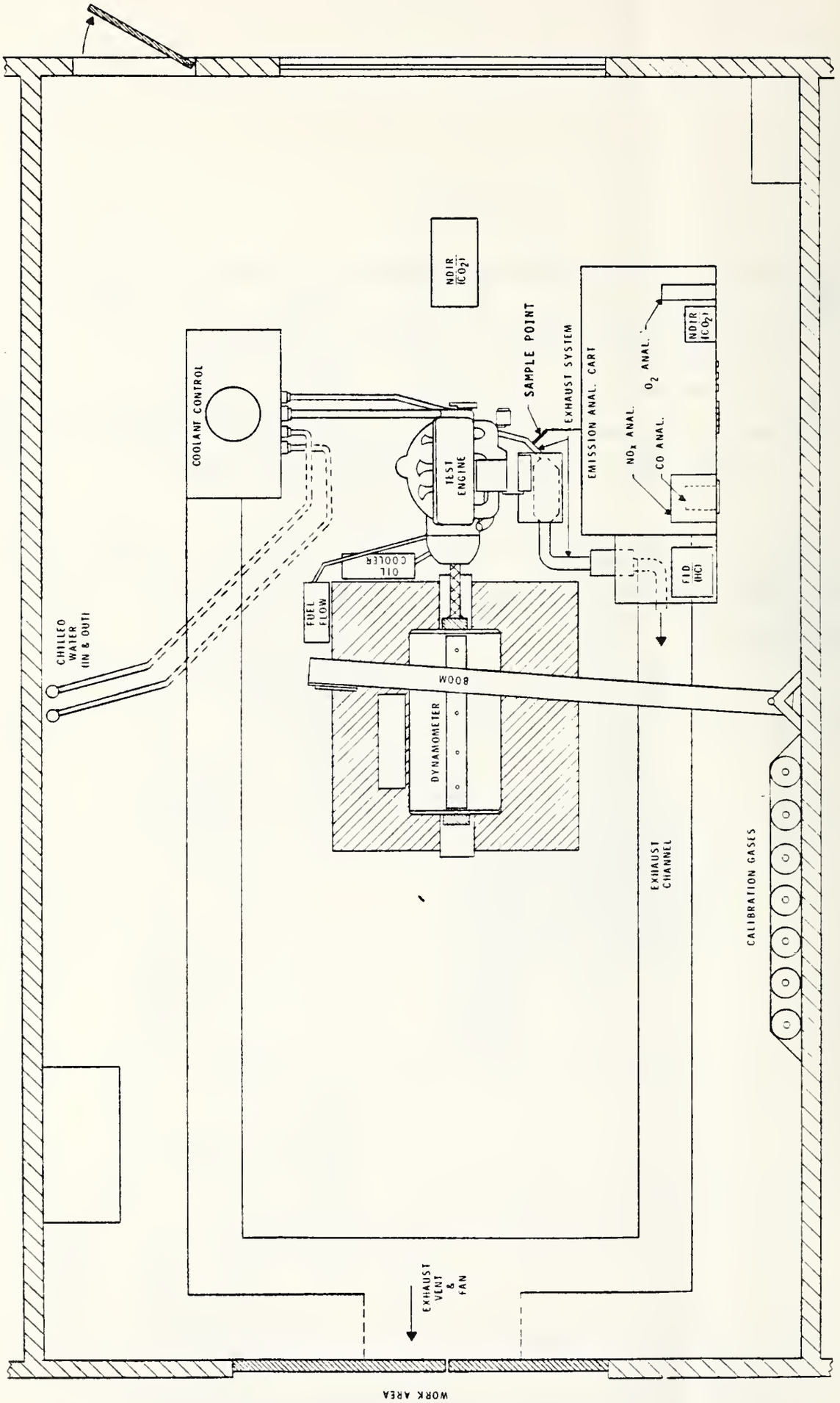

FIGURE 3. TEST CELL NO. 2 LAYOUT

Instead of the standard air cleaner, air induction was directed through a laminar-flow element connected by 4-inch ID plastic tubing to the carburetor. All engine vents (valve cover, carburetor, charcoal canister) were connected to the air-inlet system. Engine coolant and oil temperatures were maintained at 185°F ± 2°F by external heat exchangers. Although all emissions measurements were made before the catalyst, it, as well as a muffler, were installed in the exhaust system in order to duplicate the normal engine back-pressure.

2.2.1 Instrumentation

Real-time measurements of emissions and engine performance were accomplished by the analog instrumentation shown in Table 4.

2.2.2 Data Acquisition

The data acquisition system was Hewlett-Packard 21MX mini-computer with a 45kHz A/D converter and multiplexer. Analog signals from the instrumentation shown in Table 4 were routed, along with digital speed and torque signals, to this computer. The data was continuously updated on a video display and line printer. Data was stored on a disc for subsequent reduction.

2.3 BASELINE TEXT MATRIX

The baseline data for this engine was collected by operating the engine in the steady-state mode with the factory calibrations of air-to-fuel ratio (A-F), spark advance (SA), and exhaust gas recirculation (EGR). The spark timing, distributor advance characteristics are shown in Figure 4. Figure 5 gives the EGR valve displacement versus actuation pressure. During these baseline tests the A-F varied between 13.2 and 19.8, spark advance from 10° to 24° BTDC, and EGR from 0.6% to 16.8%.

The test matrix consisted of 57 speed/load points from 750 rpm to 3600 rpm, as shown in Table 5. In general, these points correspond to 0%, 25%, 50%, 75%, and 100% of maximum positive torque and 25% and 75% of maximum negative torque. (Negative torque is obtained by motoring the powered engine with the dynamometer, thus simulating deceleration.

TABLE 4. ANALOG INSTRUMENTATION

MEASURED VARIABLE	INSTRUMENT TYPE
Oil temp.	OMEGA type K thermocouple; CJ compensator
Ambient temp.	YSI Model 46T6 Tele-thermometer
Inlet air flow	MERRIAM 50MC2-4 Laminar flow element
Inlet air diff. press.	MKS Baratron type 77
Air inlet temp.	OMEGA type K thermocouple; CJ compensator
Fuel inlet temp.	OMEGA type K thermocouple; CJ compensator
Coolant inlet temp.	OMEGA type K thermocouple; CJ compensator
Relative/Humidity	WEATHERMEASURE Model HM111
Exhaust CO	BECKMAN 864 Infrared Analyzer
Exhaust CO_2	BECKMAN 864 Infrared Analyzer
Exhaust HC	BECKMAN 402 Hydrocarbon Analyzer
Exhaust NOx	BECKMAN 951 Chemiluminescent Analyzer
Exhaust O_2	BECKMAN 14330 Paramagnetic Analyzer
Intake CO_2	BECKMAN 864 Infrared Analyzer
Manifold vacuum	TYCO type AB 15 PSI transducer
Coolant exhaust temp.	OMEGA type K thermocouple; CJ compensator
Spark timing	1.8K precision potentiometer
Peak cylinder press.	KISTLER 538A/601B1 Piezoelectric
Exhaust temp. AC	OMEGA type K thermocouple; CJ compensator
Exhaust temp. BC	OMEGA type K thermocouple; CJ compensator
Exhaust press. AC	TYCO type AB 6 PSI transducer
Exhaust press. BC	TYCO type AB 6 PSI transducer

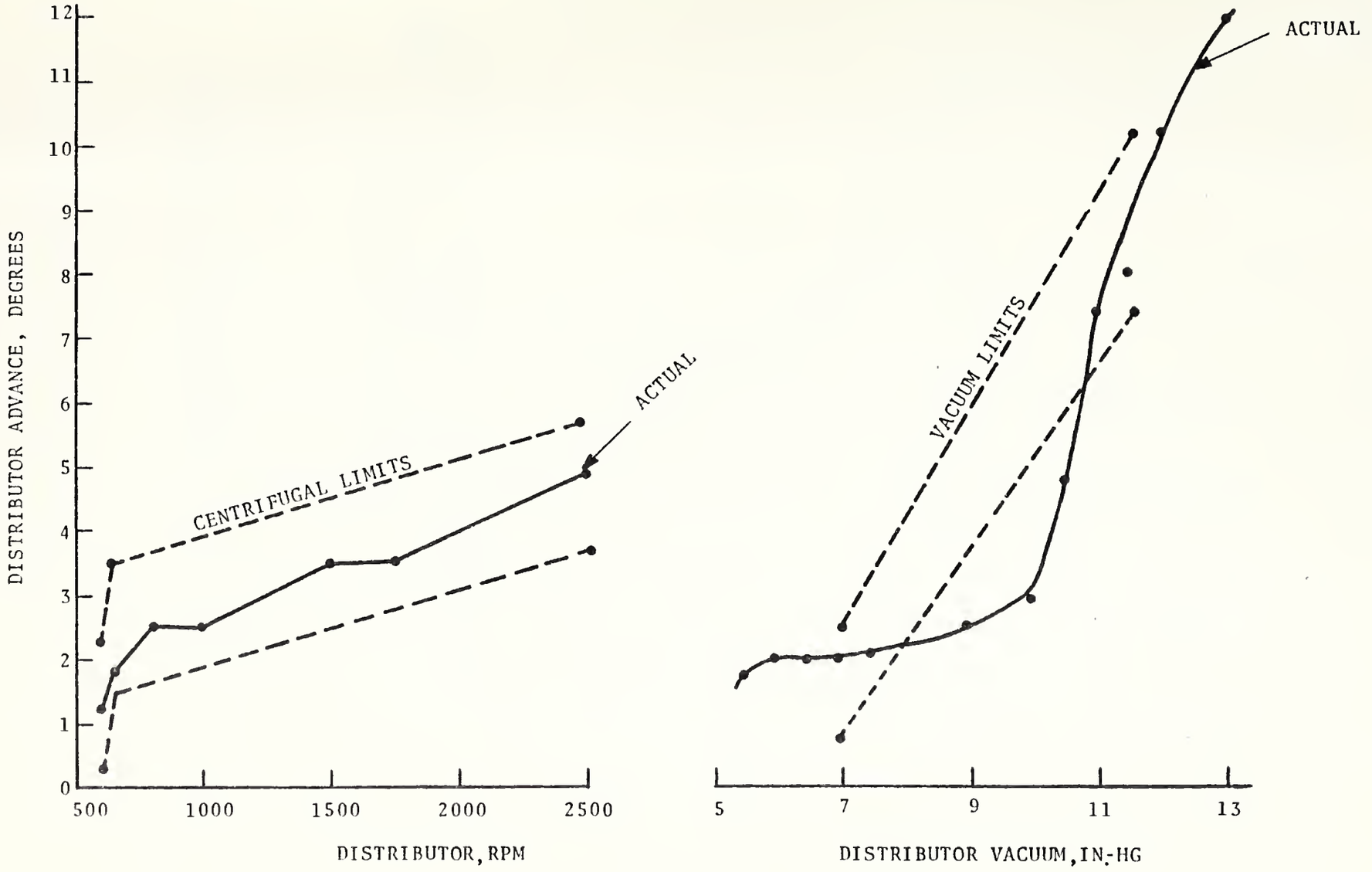

FIGURE 4. DISTRIBUTOR ADVANCE CHARACTERISTICS

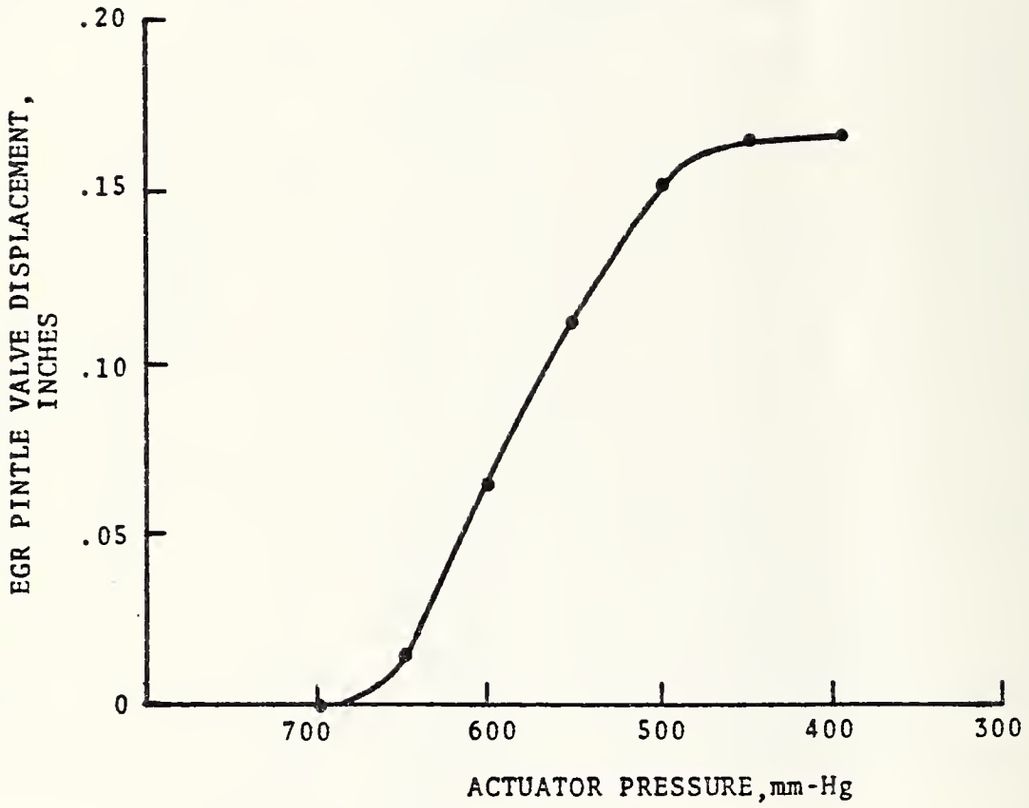

FIGURE 5. MEASURED VACUUM ACTUATOR

TABLE 5. STEADY-STATE BASELINE MAPPING SPEED-TORQUE VALUES

ENGINE SPEED, (RPM)	TORQUE, (LB-FT)
750	-7, 0, 40
880	-10, -2, 0, 40, 80, 120, 160
1000	-15, -10, -5, 0, 40, 80, 120, 160
1500	-25, -10, -5, 0, 40, 80, 120, 160
2000	-32, - 7, 0, 40, 80, 120, 160
2500	-30, -10, 0, 40, 80, 120, 160
3000	-40, -30, -10, 0, 40, 60, 80, 120, 160
3600	-48, -36, -12, 0, 35, 70, 105, 140

3. TEST PROCEDURES

All instrumentation was periodically checked and calibrated. Emissions instrumentation was calibrated before and after data collection at each power point, or every 30 minutes whichever came first. At each baseline test point, sufficient time was allowed for the operating temperatures and pressures to stabilize (typically 5 to 45 minutes) before data was collected. Each data channel was sampled 30 times in approximately 5 seconds and the data averaged.

4. DATA REDUCTION

The data acquisition system sampled the signals from the analog instrumentation shown in Table 4. All samples in each data set (speed/load point)were averaged and stored on the HP-21MX disc. Test variables were also displayed to the operator by video display and line-printer. The stored disc-data was subsequently transferred to magnetic tape for further reduction on a PDP-10 computer. All corrections to the test data and mass emissions and fuel-flow calculations were performed on the PDP-10 using the equations shown in Appendix A.

All corrected data was printed out in the format of Table B-1. The data includes Engine Speed (RPM), Load (torque) (lb-ft), the % EGR, the Air-Fuel Ratio (A/F) from exhaust and fuel-flow calculations, the exhaust concentrations (ppm or %), various temperatures and pressures, measured air flow to the engine (airflo), the humidity (grains/pound), and fuel flow (grams/second).

5. TEST RESULTS

Figure 6 gives the corrected bhp, torque,and BSFC at wide-open throttle (WOT) for this engine. The maximum horsepower and torque are within manufacturer's specifications. The BSFC is at a minimum at 1500 rpm. Figure 7 shows the fuel rate in lb/hr for all speed-load points. Figures 8 and 9 show the A-F ratio and EGR for all positive horsepower points. Distributor advance is shown in Figure 4, while CO, HC, and NOx mass emission rates as a functions of speed and load are given in Figures 10, 11, and 12.

At low power a lean mixture resulted in relatively low levels of CO and HC. At higher speeds and loads, with richer mixtures, CO and HC increased substantially. As expected, NOx increased at higher power points. In general, the results from this engine are typical of those obtained with a modern production engine. Attached as Appendix B is the test and reduced data for all positive and negative speed/load points.

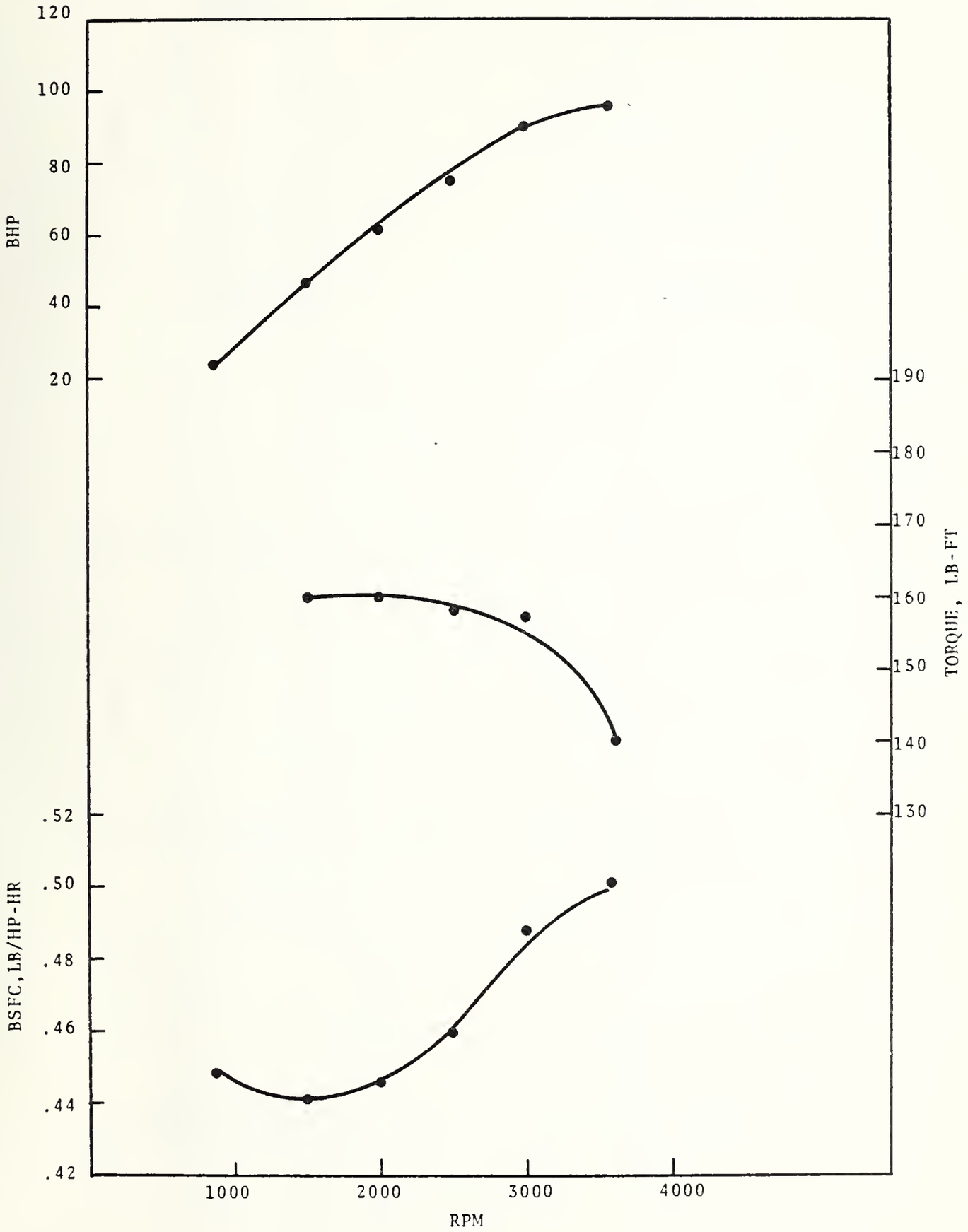

FIGURE 6. CORRECTED BHP,TORQUE, AND BSFC VS WIDE-OPEN THROTTLE

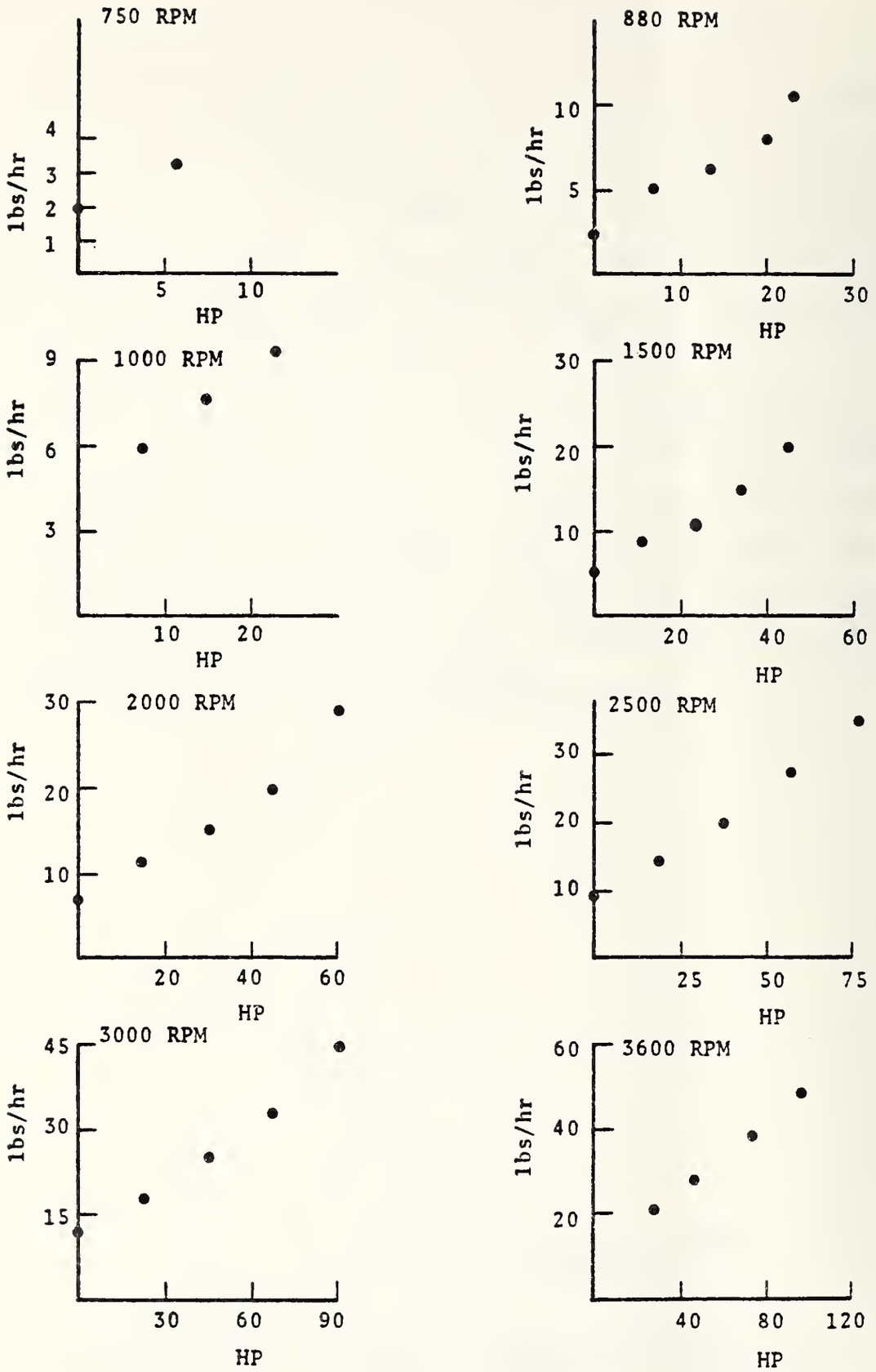

FIGURE 7. FUEL CONSUMPTION VS POWER

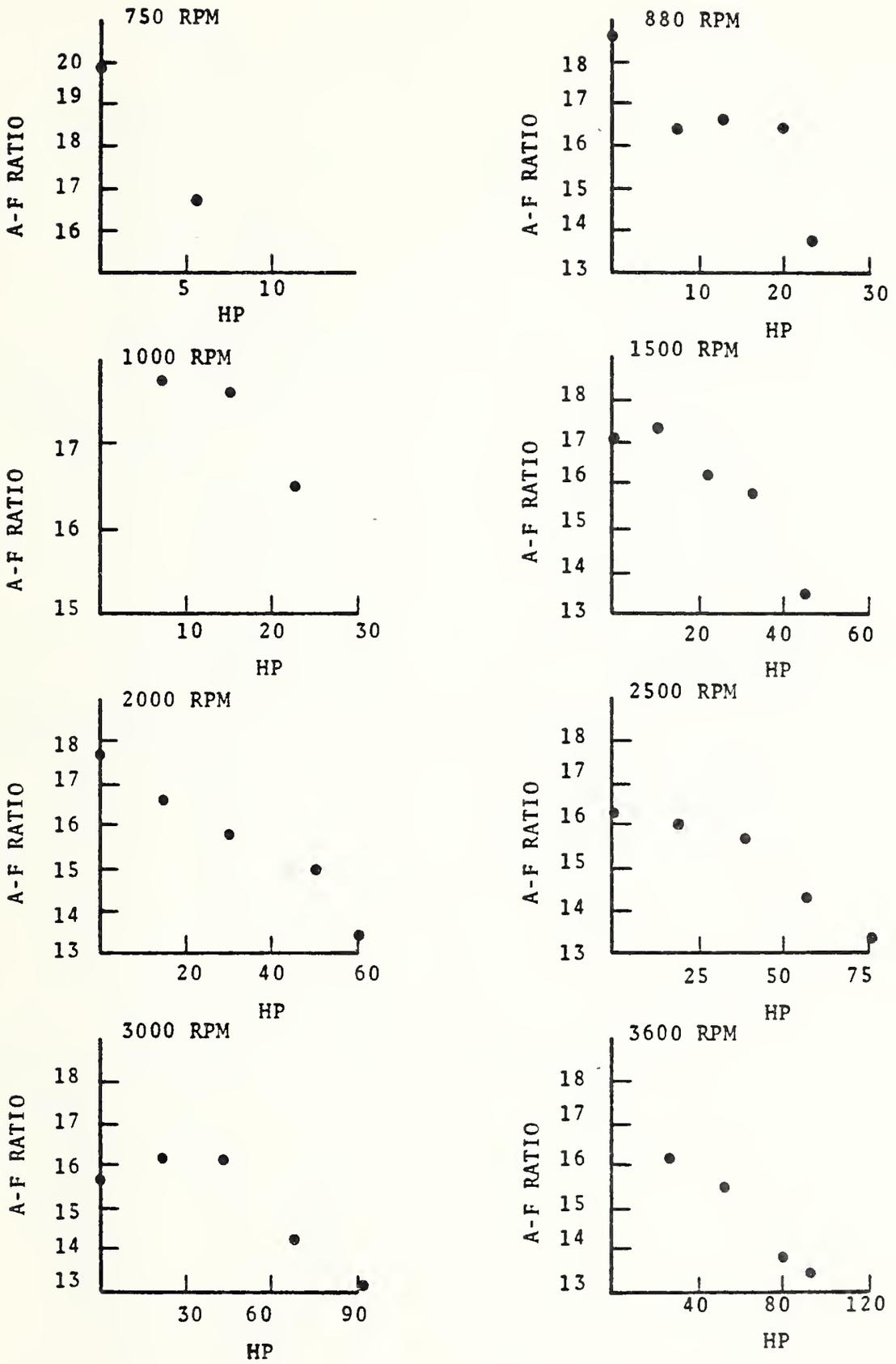

FIGURE 8. AIR-FUEL RATIO VS POWER

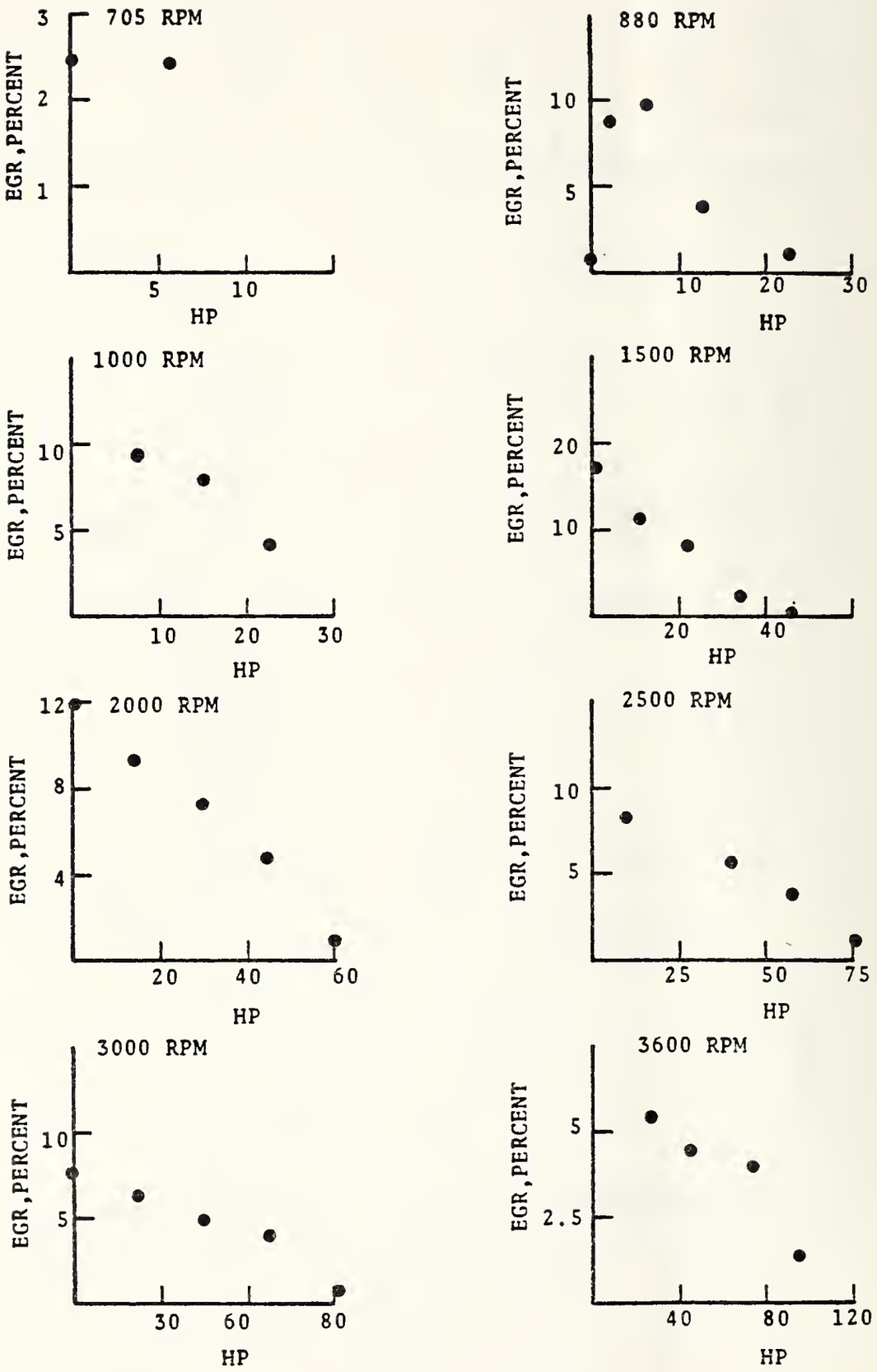

FIGURE 9. EGR VS POWER

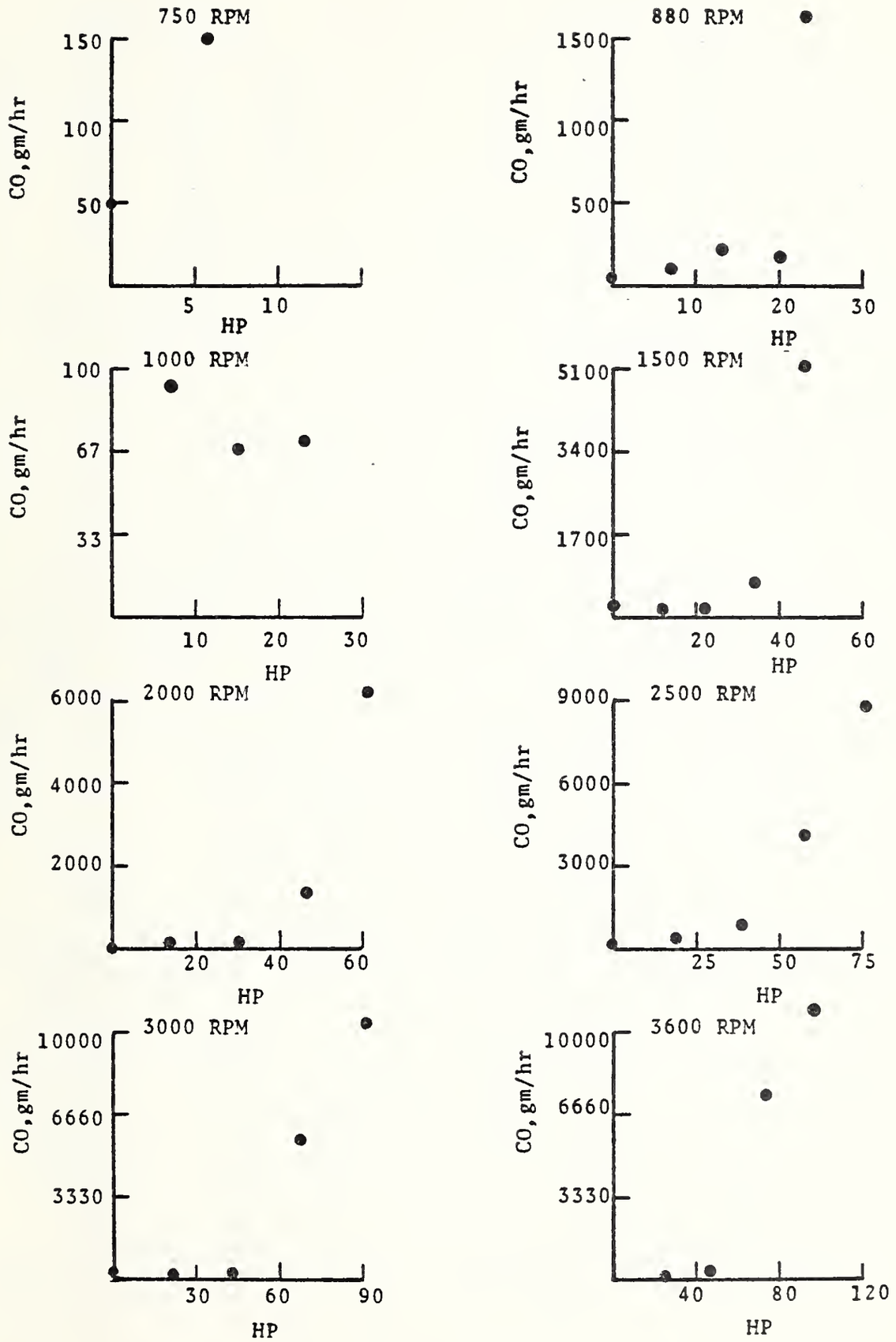

FIGURE 10. CO VS POWER

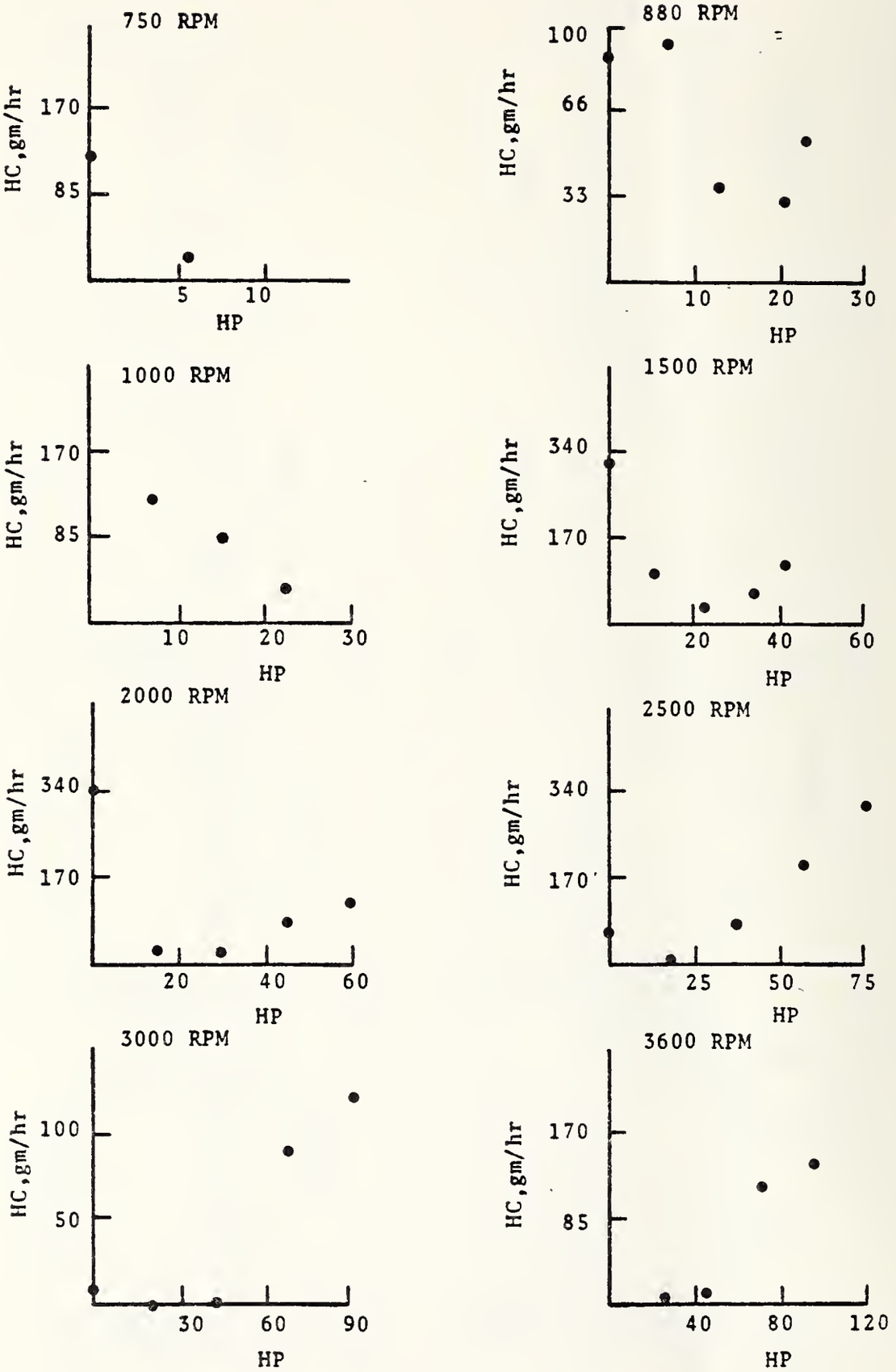

FIGURE 11. HC VS POWER

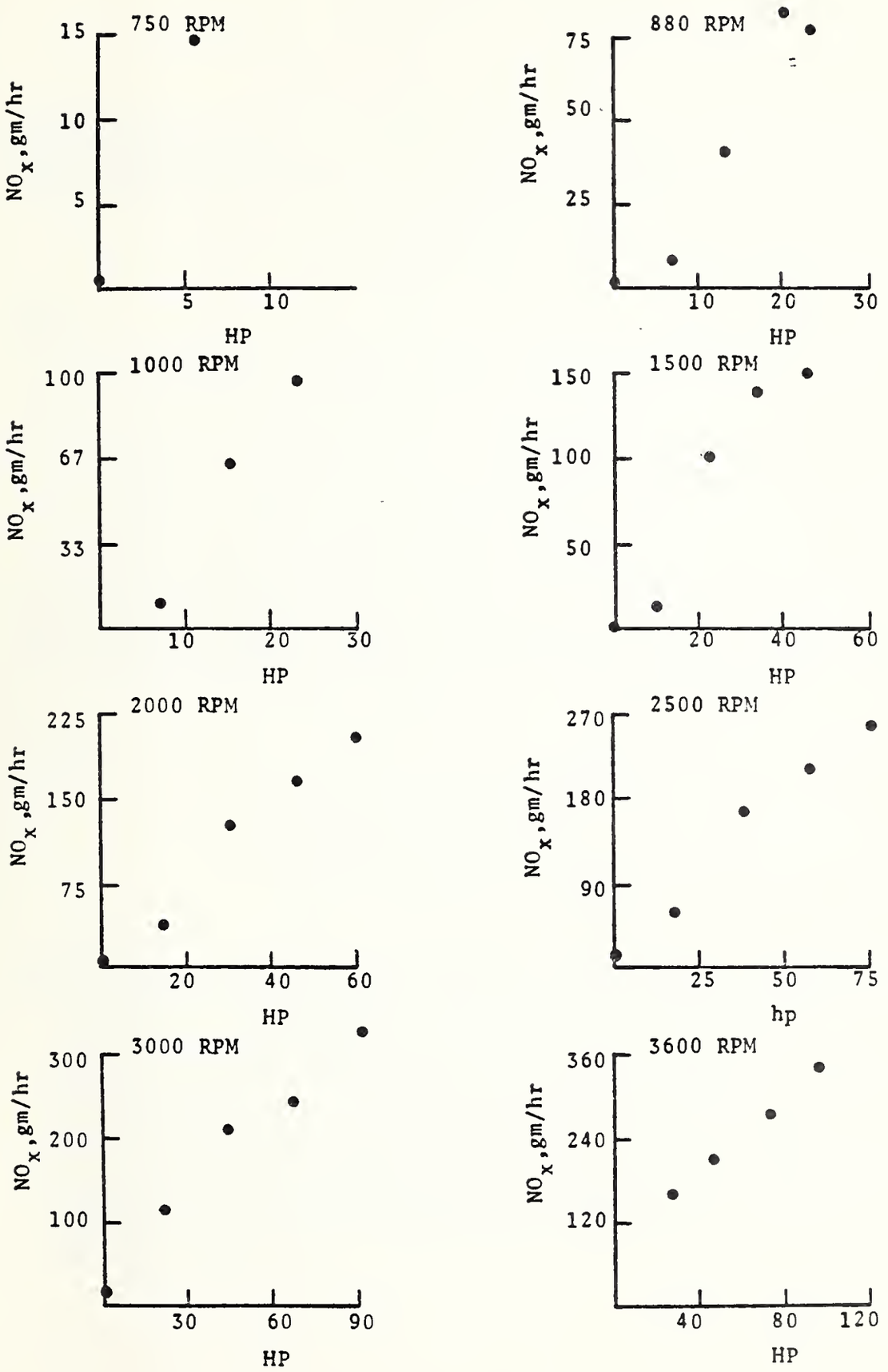

FIGURE 12. NOx VS POWER

APPENDIX A
DATA REDUCTION EQUATIONS

CORRECTED TORQUE, T_c (lb-ft)[1] From SAE J245, Spark Ignition Engine Rating Code, adjusted to standard SAE ambient conditions:

$$T_c = \frac{B_d^*}{B_{dt}} \left(\frac{t_t + A}{t^* + A} \right)^{1/2} T_t$$

where

B_d^* = Standard Dry Barometric Pressure (29.00 in. Hg, 97.9 kPa)

B_{dt} = Dry Barometric Pressure at Test Conditions

t_t = Ambient Air Temperature at Test Conditions

t^* = Standard Ambient Temperature (85°F, 29.4°C)

A = Absolute Temperature Constant (460°R, 273°K)

T_t = Measured Torque at Test Conditions.

CORRECTED HORSEPOWER, hp_c[1] From SAE J245, Spark Ignition Engine Rating Code, adjusted to standard SAE ambient conditions:

$$hp_c = \frac{T_c N}{G}$$

where

T_c = Corrected Torque (See above.)

N = Engine Speed (RPM)

G = Power Constant (5252 English, 955 SI).

---

(1) Engines with manifold preheated air inlet systems are designed to control carburetor air inlet temperature to a specific temperature. Excursions in ambient temperature below this value do not appreciably affect the controlled temperature. The engine performance correction factor as described in SAE J245 Engine Rating Code for Spark Ignition Engines has therefore been updated as follows: If ambient temperature is less than or equal to the manufacturer's stated controlled temperatures, no correction component involving carburetor inlet temperature is made. If ambient temperature exceeds the targeted controlled temperature, the normal J245 correction factor is applied with the targeted controlled temperature used in place of the standard ambient temperature.

MASS FUEL FLOW RATE (lb/hr) From volumetric measurement (corrected to 60°F per ASTM petroleum tables) and fuel specific gravity:

$$\dot{m}_f = \frac{(SpG)_f \left(\frac{lb\ H_2O}{vol}\right)(vol)_f}{\Delta\ t_T}$$

where

$\dot{m}_f$ = Fuel Flow Rate lb/hr

$(SpG)_f$ = Specific Gravity of Fuel

$(lb\ H_2O/vol)$ = Pounds of Water per Unit Volume

(vol_f) = Volume of Fuel Measured, corrected to 60°F per ASTM petroleum tables

$\Delta\ t_T$ = Time interval of volume measurement (hrs.)

CORRECTED BRAKE SPECIFIC FUEL CONSUMPTION (BSFC) (lb/HP-hr)

$$BSFC_c = \frac{\dot{m}_f}{HP_c}$$

where

$BSFC_c$ = Corrected Brake Specific Fuel Consumption

HP_c = Corrected Horsepower

$\dot{m}f$ = Mass Fuel Flow Rate (lb/hr).

AIR/FUEL RATIO (A/F) Based on emissions measurements from SPINDT, SAE #650507:

$$A/F = F_b \left[11.492\ F_c \left(\frac{1+R/2+Q}{1+R}\right) + \left(\frac{120(1-FC)}{3.5+R}\right)\right]$$

where

$$R = \frac{\%CO}{\%CO_2} = \frac{\text{Percent CO Concentration}}{\text{Percent } CO_2 \text{ Concentration}}$$

F_c = Mass Fraction of Carbon in Fuel

$$F_b = \frac{\%\ CO + CO_2}{\%\ CO + CO_2 + \%\ CH}$$

$$Q = \frac{\%\ O_2}{\%\ CO_2} = \frac{\text{Percent } O_2 \text{ Concentration}}{\text{Percent } CO_2 \text{ Concentration}}.$$

CARBON MONOXIDE (CO) MASS EMISSION RATE (Grams/Hr)

$$\text{MASS CO} = (4.383)\,(\dot{m}_f)(A/F+1)(\%CO)\left[\frac{1}{1 + 0.03148\,(\%\,CO_2)\,\frac{\%CO+\%CO_2}{\%CO+3\%CO_2}}\right]$$

where

$\dot{m}_f$ = Mass Fuel Flow Rate
A/F = Air-to-Fuel Ratio
% CO = Percent CO, Concentration
% CO_2 = Percent CO_2, Concentration.

HYDROCARBON (HC) MASS EMISSION RATE (Grams/Hr)

$$\text{Mass HC} = (0.0002207)\,(\dot{m}_f)\,(A/F+1)\,(\text{ppm HC})$$

where

$\dot{m}_f$ = Mass Fuel Flow Rate
A/F = Air-to-Fuel Ratio
ppm HC = Parts per Million , HC Concentration.

OXIDES OF NITROGEN (NOx) MASS EMISSION RATE (Grams/Hr)

$$\text{Mass NOx} = 0.007201\,(m_f)\,(A/F+1)\,(\text{ppm NOx})\left[\frac{1}{1 + .03148\,(\%\,CO_2)\left(\frac{\%CO+\%CO_2}{\%CO+3\%CO_2}\right)}\right]$$

where

$\dot{m}_f$ = Mass Fuel Flow Rate
A/F = Air-to-Fuel Ratio
ppm NOx = Parts per Million, NOx Concentration
% CO = Percent CO, Concentration
% CO_2 = Percent CO_2, Concentration
K_H = Humidity Correction Factor.

HUMIDITY CORRECTION FACTOR

$$K_H = \frac{1}{1-.0047\,(\text{Absolute Humidity} - 75)}$$

where absolute humidity is in grains/pound of dry air.

ABSOLUTE HUMIDITY (AH) (Grains/Lb,Dry Air):

$$AH = \frac{(RH)\ P_{SU}}{1.608\ (P_{AMB} - RH \cdot P_{SU})}$$

where

RH = Measured Relative Humidity

P_{SU} = Saturated Vapor Pressure (from Keenan and Keyes Steam Tables)

P_{AMB} = Ambient Barometric Pressure.

APPENDIX B
CHRYSLER 225 CID TEST DATA AND REDUCED TEST DATA

EXPLANATION OF DATA COLUMN HEADINGS

RPM	
CTORQ LB-FT	Torque corrected to standard conditions, SAE, J245
EGR	
A/FEX	Air-to-Fuel ratio Calculated using Spindt method
A/FTC LB/HR	Air-to-Fuel ratio Calculated using total carbon method
CNOX PPM	Oxides of nitrogen corrected for relative humidity
HC PPM	Hydrocarbons, parts per million
CO	Carbon monoxide, percent
CO2	Carbon dioxide, percent
O2	Oxygen, percent
COOLE DEG-F	Exit engine coolant to heat exchanger
EXOIL DEG-F	Exit engine oil to heat exchanger
AIRDP INH2O	Pressure differential across Merriam airflow sensor
AIRFLO LB/MIN	Engine inlet airflow
ABSHUM GR/LB	Grains per pound
FLO G/S	Measured fuel flow, grams per second

Note: Runs 1-85 were taken during warm-up.

TABLE B-1. CHRYSLER 225 CID TEST DATA

MULTIPARAMETER ENGINE MAPPING SHORT FORM TEST SUMMARY OF FILE OPTD98

REC NUM	NOMINAL CODE	TIME HHMMSS.	RPM RPM	TORQ LB-FT	EGR %	A/FEX	A/FTL LB/HR	CNOX PPM	HC PPM	CO %	CO2 %	O2 %	COOLE DEG-F	EXOIL DEG-F	AIRDP INH2O	AIRFLO LB/MIN	ABSHUM GR/LB	FLO G/S	DATE JUL.YR
1	989833 0	90342.	1600	48	4 0	14.1	13.3	714.	2161.	2.08	12 4	.5	188.	188.	-.53	2.133	21.760	3.000	183.79
2	989833 0	90441.	1600	48	4.1	14 1	13.3	720.	2127.	2.07	12.4	.4	189.	189.	- 53	2.125	21.940	3.000	183.79
3	989833 0	90547.	1600	48	4.1	14.1	12.9	713.	2261	1.91	12.5	.4	189.	189	- 53	2.130	21.700	3.000	183.79
4	989833 0	90642.	1600	48	4.1	14 1	12.9	711.	2343.	1.86	12 5	4	189.	189.	-.53	2.133	21.600	3.000	183.79
5	989833 0	90743.	1600	48	4 1	14.1	13.4	709.	2094.	1.87	12.5	.4	189.	188.	-.53	2.129	21.650	3.000	183.79
6	989833 0	90843.	1600	48	4.1	14.2	13.5	712.	2047.	1.79	12.5	.4	189.	189.	-.53	2.129	22.000	3.000	183.79
7	989833.0	90944.	1600	48	4.1	14.1	13.4	711.	2058.	1.88	12.5	.4	189.	189.	-.53	2.126	22.210	3.000	183.79
8	989833 0	91041.	1600	48	4.1	14.2	13.5	717.	2063.	1.78	12.5	.4	189	189.	-.53	2.119	22.490	3.000	183.79
9	989833 0	91142.	1600	48	4.1	14.2	13 5	709.	2103.	1.76	12.5	.4	188	189.	- 53	2.127	22.250	3.000	183.79
10	989833 0	91242.	1600	48	4.1	14 2	13.5	709.	2021.	1.76	12.5	.4	189	189.	-.53	2.125	22.310	3.000	183.79
11	989833 0	91341.	1600	48	4.1	14 2	13.5	711.	2093.	1.71	12.5	.4	188.	189.	-.53	2.131	22.360	3.000	183.79
12	989833 0	91413.	1600	48	4.1	14.2	13.5	707.	2060.	1.78	12.5	.5	189.	189.	-.54	2.139	22.280	3.000	183.79
13	989833 0	92842.	1600	49	4.0	14 2	12 0	748.	2287.	2.16	12.4	.7	190.	188.	-.55	2.175	29.590	3.000	186.79
14	989833 0	92145.	1600	49	4.1	14.2	12.5	748.	2241.	2.02	12.4	.6	189.	188.	-.55	2.169	29.980	3.000	186.79
15	989833 0	92244.	1600	49	4 1	14 2	12.9	746.	2231.	1.95	12 5	.6	189	188	-.55	2.171	30.020	3.000	186.79
16	989833 0	92344.	1600	49	4 0	14 2	13.4	748.	1992.	2.02	12.4	.6	188.	188.	-.55	2.169	30.260	3.000	186.79
17	989833 0	92444.	1600	50	3 9	14 3	13.5	753.	1941.	1.85	12 5	.6	188.	188.	-.55	2.177	30.180	3.000	186.79
18	989833 0	92545	1600	49	4.1	14 3	13.6	749.	1882.	1.82	12 5	.6	188.	188.	- 55	2.160	29.980	3.000	186.79
19	989833 0	92645.	1600	49	3 9	14 4	13.6	753.	1922.	1 73	12.6	.6	188.	189	-.55	2.164	30 000	3 000	186.79
20	989833 0	92745.	1600	49	4.1	14 3	13.4	754.	2094.	1.82	12 6	.6	188.	188.	- 55	2.173	29.790	3.000	186.79
21	989833.0	92844.	1600	50	4.2	14.3	13.0	756.	2127.	1.89	12.5	.6	189.	189.	-.55	2.152	30.160	3.000	186.79
22	989833 0	92945.	1600	50	4.2	14 3	13.5	757.	1936.	1 73	12 6	.6	189.	189.	-.55	2.143	30.000	3.000	186.79
23	989833 0	93044.	1600	49	4.2	14 3	13.5	752.	1907.	1.83	12.5	.6	189.	189.	- 55	2.157	30.030	3.000	186.79
24	989833 0	93142.	1600	49	4 0	14.3	13 5	751.	2013.	1.78	12.5	.6	189.	189.	-.55	2.178	30.180	3.000	186.79
25	989833 0	85601.	1600	51	.6	14 1	13.0	767.	2273.	2.76	12 8	1 8	192.	186.	-.51	1.988	31.200	3.000	187.79
26	989833.0	85605.	1600	51	.6	14 1	13.0	765.	2288.	2.72	12.8	1 8	192.	186.	-.50	1.983	31.120	3.000	187.79
27	989833.0	85610	1600	51	.6	14.1	13 0	765.	2206.	2 73	12.0	1 8	192.	186.	-.51	1.994	31.130	3.000	187.79
28	989833.0	85614.	1600	51	.6	14.1	13 0	764.	2288.	2 75	11 9	1 8	192.	186.	-.51	1.998	31.040	3.000	187.79
29	989833 0	85619.	1600	51	.6	14 1	13.0	765.	2258.	2.71	12 0	9	192.	186.	-.51	1.995	31.070	3.000	187.79
30	989833.0	85623.	1600	51	.6	14 1	13.1	765	2231.	2 65	12 8	9	193.	186.	-.51	1.995	31.000	3.000	187.79
31	989833 0	90008.	1600	51	.6	14 1	13.3	75°	2064.	2 41	12.1	.7	189.	188.	-.51	1.995	31.050	3.000	187.79
32	989833 0	90308.	1600	51	5.0	14 0	13.3	735.	2067.	2.51	12.0	.7	189.	188.	-.50	1.950	31.000	3.000	187.79
33	989833 0	90312.	1600	51	5.0	14 1	13.2	738.	2088.	2.45	12.1	.7	189.	188	-.50	1.955	31.140	3.000	187.79
34	989833.0	90317.	1600	51	5.0	14 0	13.2	732.	2073.	2.50	12.1	.7	189.	188	-.50	1.955	31.150	3.000	187.79
35	989833 0	90321.	1600	51	5.0	14 1	13.3	735.	2096.	2 42	12.1	.7	189.	188	- 50	1.954	31.180	3.000	187.79
36	989833 0	90827.	1600	49	4.6	14 4	13.3	758	2181.	2.52	12.0	1.2	188.	189.	-.49	1.900	31.100	3.000	187.79
37	989833.8	90833.	1600	49	4.6	14 3	12.5	756.	2281.	2 53	11.9	1.2	188.	189.	-.49	1.913	31 870	3.000	187.79
38	989833 0	90837	1600	50	4.5	14 4	12.5	756.	2296.	2.37	12.0	1.2	188.	189.	-.49	1.913	30.790	3.000	187.79
39	989833 0	90842.	1600	50	4.5	14 4	13.3	755.	2182	2.41	12 8	1.2	189	189.	-.49	1.908	30.730	3.000	187.79
40	989833 0	90846.	1600	49	4.6	14.3	12.8	757.	2295.	2.49	12.0	1 2	189.	189.	-.49	1.910	30.730	3.000	187.79
41	989833 8	91000.	1600	49	4.3	14.3	13 2	756.	2145.	2.52	12.0	1.1	188.	189.	-.49	1.915	31.120	3.000	187.79
42	989833 0	91004	1600	49	4 4	14 3	13 3	756.	2181.	2 47	12.0	1 1	188.	189.	-.49	1.915	31.210	3.000	187.79
43	989833 0	91009.	1600	49	4.4	14.3	12.9	757.	2172.	2 51	11.9	1.1	188.	189	- 49	1.914	31.100	3.000	187.79
44	989833 0	91014.	1600	49	4.4	14.3	12.9	754.	2183.	2.48	11.9	1 1	188.	189	-.49	1.911	31.190	3.000	187.79
45	989833 0	91133	1600	51	4 4	14 3	13 4	752.	2137	2.35	12 0	1 0	189.	189	-.50	1.950	31.200	3 000	187.79
46	989833 0	91137	1600	51	4.4	14 3	13 4	753	2075	2.44	12.0	1.0	188.	189.	-.50	1.949	31.110	3.000	187.79
47	989833 0	91142	1600	51	4 4	14 3	13 4	753.	2057	2.37	12.0	1 0	188.	189.	-.50	1.949	31.110	3.000	187.79
48	989833 0	91146	1600	51	4 4	14 3	13.4	754.	2073.	2.39	12.0	1 0	189.	189	-.50	1.954	31.200	3.000	187.79

TABLE B-1. CHRYSLER 225 CID TEST DATA (CONTD)

REC NUM	NOMINAL CODE	TIME HHMMSS	RPM	CTORQ LB-FT	EGR %	A/FEX	A/FTC LB/HR	CNOX PPM	HC PPM	CO %	CO2 %	O2 %	CODLE DEG-F	EXOIL DEG-F	AIRDP INH2O	AIRFLO LB/MIN	ABSHUM GR/LB	FLO G/S	DATE JUL.YR
49	989833 0	91151.	1600	51	4 4	14.3	13.4	754	2055.	2 38	12.0	1 0	188.	189.	-.50	1.953	31.200	3.000	107.79
50	989833 0	91156.	1600	51	4 4	14.3	13.4	755.	2081.	2.35	12.0	1 0	188.	189.	-.50	1.955	31.050	3 000	107.79
51	989833 0	91737.	1600	51	4.2	14.3	13.5	752.	2043.	2.27	12.0	.9	188.	189.	-.50	1.946	31.630	3.000	107.79
52	989833.0	91803.	1600	51	4.2	14.3	13.5	751.	2059.	2.25	12.1	.9	188.	189.	-.50	1.944	31.540	3 000	107.79
53	989833 0	91902.	1600	51	4 2	14.3	13.5	753.	2041.	2.28	12.1	.9	189.	189.	-.50	1.945	31.660	3.000	107.79
54	989833 0	92001.	1600	51	4 2	14.3	13.4	754.	2029.	2.31	12.0	.9	189.	189.	-.50	1.947	31.490	3.000	107.79
55	989833 0	92100	1600	51	4.2	14.3	13.5	751.	2009.	2.22	12.1	.9	188.	189.	-.50	1.952	30.800	3.000	107.79
56	989833.0	92202.	1600	51	4 2	14.3	13.6	752.	2019.	2.16	12.1	.9	189.	189.	-.50	1.949	30.740	3.000	107.79
57	989833.0	92300.	1600	51	4.1	14.3	13.5	751.	2024.	2.20	12.1	.8	188.	189.	-.50	1.948	30.600	3.000	107.79
58	989833 0	92359.	1600	51	4.1	14.3	13.5	750.	2019.	2.28	12.0	.9	188.	189.	-.50	1.955	30.450	3.000	107.79
59	989833.0	92501.	1600	51	4.1	14.3	13.5	749.	2010.	2.18	12.1	.8	188.	189.	-.50	1.952	30.570	3 000	107.79
60	989833 0	92605.	1600	51	4.2	14.2	13.5	753.	2011.	2 21	12.1	.8	188.	189.	-.50	1.944	31.030	3.000	107.79
61	989833 0	92659.	1600	51	4 2	14.2	13.5	752.	2024.	2.25	12.0	.8	189.	189.	-.50	1.949	31.110	3.000	107.79
62	989833 0	92756.	1600	51	4 2	14.2	13.6	751.	1986.	2.20	12.1	.8	189.	189.	-.50	1.949	31.300	3 000	107.79
63	989833 0	151417.	1600	51	3.9	14.0	12.9	735.	2089.	3.23	11 8	1.2	189.	192.	-.51	1.967	29.870	3.000	107.79
64	989833 0	151517.	1600	50	3 9	14.1	12 9	737.	2077.	3.20	11.7	1 3	189	192.	-.51	1.971	30.530	3.000	107.79
65	989833 0	151616.	1600	50	3.8	14.2	13 0	736.	2077.	3.15	11 6	1.4	189.	191.	-.51	1.957	30.920	3 000	107.79
66	989833 0	151812.	1600	51	4.0	14.3	13.1	740	2093.	3 16	11.5	1.6	189.	191.	-.52	1.982	30.610	3.000	107.79
67	989833 0	151914.	1600	50	4.0	14.3	13.1	738.	2131.	3 43	11.2	1.7	189.	191.	-.51	1.971	30.300	3.000	107.79
68	989833 0	152017.	1600	50	3.9	14.3	13.1	739.	2161.	3 55	11.1	1.8	189.	191	-.52	1.978	30.700	3.000	107.79
69	989833 0	152117.	1600	51	3.9	14.2	13.1	735.	2217.	3 83	10 8	1 9	189.	191.	-.51	1.956	31.410	3 000	107.79
70	989833.0	152217.	1600	50	3.9	14.2	13 2	733.	2223.	3 91	10.6	2.0	189.	191.	-.51	1.973	31.320	3.000	107.79
71	989833 0	152317.	1600	50	3 9	14.2	13 2	718	2276.	4 03	10 5	2 0	189.	191.	-.52	1.988	31.250	3 000	107.79
72	989833.0	152417.	1600	50	4.0	14 2	13.3	717.	2279.	4.07	10.3	2.1	189.	191.	-.51	1.975	31.310	3.000	107.79
73	989833 0	152518.	1600	50	3.9	14.2	13.2	708.	2312.	4 11	10.3	2.2	189.	191.	-.52	1.994	31.010	3.000	107.79
74	989833.0	83746.	1600	51	4.2	14 6	14.3	747.	1484	1 29	12.5	.6	189.	189.	-.52	2.052	34.730	3.000	121.79
75	989833.0	83853.	1600	51	4.1	14.6	14.3	747.	1465.	1.27	12.5	.7	189.	189.	-.52	2.052	34.520	3.000	121.79
76	989833.0	83954.	1600	51	4.2	14.6	14.4	748.	1428.	1 29	12 5	.6	189.	189.	-.52	2.049	34.760	3 000	121.79
77	989833 0	84054.	1600	51	4.2	14.5	14.3	748.	1449.	1 35	12.5	.6	189.	189.	-.52	2.050	34.670	3.000	121.79
78	989833.0	84153.	1600	51	4.2	14.6	14.4	749.	1445.	1.31	12.5	.6	189.	189.	-.52	2.052	35.110	3.000	121.79
79	989833 0	84253.	1600	51	4.1	14.6	14.4	749.	1417.	1.27	12.5	.6	189.	189.	-.52	2.048	34.820	3.000	121.79
80	989833 0	84354.	1600	51	4.2	14.6	14.4	746.	1427.	1 26	12 5	.6	189.	189.	-.52	2.052	34.310	3 000	121.79
81	989833 0	84453.	1600	51	4 1	14.5	14.3	746.	1461.	1.32	12 5	.6	188.	189.	-.52	2.044	33.920	3.000	121.79
82	989833.0	84552.	1600	51	4 2	14.5	14 4	745.	1447.	1.25	12.5	.5	189.	189.	-.52	2.052	34.180	3.000	121.79
83	989833 0	84654.	1600	51	4.2	14.5	14 4	745.	1421.	1.28	12.5	.5	189.	189.	-.52	2.044	34.360	3.000	121.79
84	989833 0	84758.	1600	51	4.2	14.5	14.4	747.	1400.	1.29	12 5	.5	189.	190.	-.52	2.050	34.210	3.000	121.79
85	989833 0	84920.	1600	51	4.2	14.5	14.4	746.	1402.	1.21	12.5	.5	189.	190.	-.52	2.044	33.930	3.000	121.79
86	982017 0	25950.	1998	81	7.1	16.3	16.7	695.	274.	.12	12.5	2.0	189.	195.	-1.06	4.205	18.920	3.000	122.79
87	982017 0	30003.	1998	80	7.1	16.3	16.7	696.	273.	.12	12.4	1.9	190.	195.	-1.06	4.196	18.900	3.000	122.79
88	982017 0	30010.	1998	80	7.1	16.2	16.7	696	278.	.12	12.5	1.9	191.	195	-1.07	4.224	19.110	3.000	122.79
89	982017 0	30015.	1989	81	7.1	16.2	16.7	696.	294.	.12	12.5	1.8	191.	195	-1.06	4.204	19.160	3.000	122.79
90	982019 0	30529.	1998	79	7.5	15.9	16.1	690.	451.	.16	12.7	1.5	191.	195	-1.02	4.000	18.000	3.000	122.79
91	982018.0	30535.	1989	79	7.5	15.9	16.1	689.	444.	.17	12.7	1.5	190.	195.	-1.01	3.969	18.760	3.000	122.79
92	982019 0	30540.	1998	79	7.6	15 9	16.1	690.	431.	.16	12.7	1.5	189.	195.	-1.01	3.963	18.510	3.000	122.79
93	982019.0	30545.	1989	78	7.6	15.9	16.2	688.	423.	.16	12.7	1.5	188.	195	-1.01	4.004	18.370	3.000	122.79
94	982019.0	30550.	1990	79	7.6	16 0	16.2	689.	429.	16	12 7	1.5	188.	196.	-1 01	4.008	18.440	3.000	122.79
95	982117.0	93331.	1995	38	8.2	16.0	17.3	219.	740.	.19	11 6	2.5	190.	192.	-.81	3.386	19.160	1.682	123.79
96	982117 0	93338.	1995	38	8 1	16 0	17.3	214.	756.	20	11.6	2.5	190.	193.	-.81	3.312	19.270	1.677	123.79
97	982117 0	95609.	1991	40	8.3	17.0	17.5	185.	915.	.20	11.4	2.0	190.	193.	-.84	3.418	18.550	1 699	123.79
98	982117.0	100702.	1993	40	9 3	16.0	16.4	257.	539.	.19	12.4	2.7	190.	193	-.78	3.158	17.170	1.676	123.79
99	982117.0	100707.	1991	40	9 3	16.0	16.5	255.	502.	.18	12.4	2.7	190.	193	-.78	3.152	17.460	1.677	123.79
100	982117.0	100712.	1991	40	9 3	16.0	16 4	256	566.	.18	12.4	2.7	190	193.	-.78	3.165	17.600	1.675	123.79
101	982117.0	100717.	1994	40	9 3	16.0	16.3	255	590.	.18	12.4	2.7	190.	192.	-.78	3.165	17.740	1.682	123.79
102	982117 0	100721.	1992	39	9 3	16.0	16 3	258.	569.	18	12 5	2.7	190.	193.	-.78	3.162	17.940	1.677	123.79
103	982117 0	100725.	1992	40	9 4	16 0	16 4	265	541.	18	12 4	2.7	190.	193	-.78	3.151	18.000	1 674	123.79

TABLE B-1. CHRYSLER 225 CID TEST DATA (CONTD)

REC NUM	NOMINAL CODE	TIME HHMMSS.	RPM RPM	CTORQ LB-FT	EGR %	A/FEX	A/FTC LB/HR	CNOX PPM	HC PPM	CO %	CO2 %	O2 %	COOLE DEG-F	EXOIL DEG-F	AIRDP INH2O	AIRFLO LB/MIN	ABSHUM GR/LB	FLO G/S	DATE JUL.YR
104	982117 0	100730.	1992	40	9.4	16.0	16.5	263.	507.	.18	12.4	2.7	190.	193.	-.70	3.158	17.730	1.681	123.79
105	982117 0	100734.	1994	40	9.3	16.0	16.3	255.	569.	.10	12.4	2.7	190.	193.	-.70	3.160	17.610	1.679	123.79
106	982117.0	100738.	1993	40	9.3	16.0	16.3	260.	623.	.18	12.3	2.7	189.	193.	-.70	3.166	17.700	1.675	123.79
107	982117.0	100743.	1991	40	9.4	16.0	16.3	261.	640.	.10	12.4	2.7	189	193	-.70	3.166	17.810	1.678	123.79
108	982219.0	101527.	2000	3	12.1	17.6	1.0	46.11700.		.33	10.2	5.3	190.	191.	-.51	2.053	17.480	1.061	123.79
109	982219.0	101531.	2000	3	12.0	17.7	1.0	46.11630.		.35	10.2	5.3	190.	191.	-.51	2.055	17.360	1.055	123.79
110	982219.0	101539.	2000	4	11.9	17.6	1.0	45.12080.		.34	10.3	5.3	190.	191.	-.51	2.047	17.720	1.066	123.79
111	982219.0	101544.	2001	3	12.0	17.6	1.0	43.11500.		.34	10.3	5.3	190.	191.	-.51	2.050	17.770	1.065	123.79
112	982219.0	101548.	2000	3	12.0	17.7	1.0	45.11140.		.35	10.3	5.3	190.	191.	-.51	2.060	17.040	1.071	123.79
113	982219.0	101552.	2000	3	12.0	17.6	1.0	46.12000.		.36	10.3	5.3	190.	191.	-.51	2.049	17.070	1.069	123.79
114	982219.0	101557.	2000	3	12.0	17.5	1.0	44.11850.		.35	10.4	5.3	190.	191.	-.51	2.054	17.770	1.062	123.79
115	982219.0	101601.	2000	3	12.1	17.5	1.0	43.11750.		.35	10.3	5.2	190.	191.	-.51	2.055	17.580	1.066	123.79
116	982219.0	101606.	2000	3	12.1	17.6	1.0	43.11680.		.35	10.3	5.2	190.	191.	-.51	2.062	17.530	1.075	123.79
117	982219.0	101614.	2000	3	12.0	17.5	1.0	43.12000.		.36	10.3	5.3	190.	191	-.51	2.056	17.320	1.069	123.79
118	982219.0	101631.	2000	3	12.0	17.6	1.0	41.11930.		.34	10.3	5.3	190.	191.	-.51	2.059	17.480	1.071	123.79
119	981917.0	103122.	2000	120	4.7	15.1	14.4	741.	1069	.97	13.0	1.0	192.	194	-1.22	4.957	16.450	2.904	123.79
120	981917.0	103127.	2000	120	4.6	15.1	14.4	742.	1052	1.00	13.1	1.0	192.	194.	-1.23	4.960	16.340	2.909	123.79
121	981917.0	103138.	2000	119	4.6	15.0	14.3	740.	1059.	1.04	13.0	1.0	190.	194.	-1.22	4.926	16.120	2.884	123.79
122	981917.0	103143.	2000	119	4.7	15.0	14.3	740.	1050.	1.04	13.0	1.0	189.	194.	-1.21	4.920	16.080	2.882	123.79
123	981917.0	103147.	2000	119	4.7	15.0	14.3	741.	1060.	1.04	13.1	1.0	188.	193.	-1.22	4.937	16.020	2.869	123.79
124	981917.0	103151.	2000	119	4.8	15.0	14.3	738.	1063.	1.01	13.1	1.0	188.	194.	-1.22	4.938	16.030	2.880	123.79
125	981917.0	103156.	2000	119	4.8	15.0	14.3	739.	1065.	1.01	13.1	1.0	188.	194.	-1.23	4.995	16.090	2.871	123.79
126	981917.0	103200.	2000	119	4.8	15.0	14.3	740.	1059.	1.03	13.1	1.0	189.	195.	-1.23	4.998	16.040	2.870	123.79
127	981917.0	103204.	2000	119	4.8	15.0	14.3	739.	1059.	1.09	13.0	1.0	190.	195.	-1.23	4.985	16.050	2.890	123.79
128	981917.0	103208.	2000	119	4.8	15.0	14.3	738.	1051.	1.07	13.0	1.0	191.	194.	-1.22	4.957	15.990	2.880	123.79
129	981815.0	103536.	2000	159	1.1	13.6	13.2	734.	1405.	3.61	11.5	.7	188.	196.	-1.51	6.184	15.960	4.061	123.79
130	981815.0	103600.	2000	160	1.0	13.6	13.2	735.	1406.	3.58	11.5	.7	188.	196.	-1.51	6.120	15.900	3.952	123.79
131	981815.0	103604.	2000	160	.9	13.6	13.2	734.	1390.	3.59	11.5	.7	188.	196.	-1.52	6.141	15.860	3.898	123.79
132	981815.0	103608.	2000	160	.9	13.6	13.2	734.	1400.	3.61	11.5	.7	189.	196	-1.52	6.136	15.950	3.894	123.79
133	981815.0	103612.	2000	160	.9	13.6	13.1	734.	1394.	3.64	11.5	.7	190.	196	-1.51	6.119	15.890	3.952	123.79
134	981815.0	103616.	2000	160	.9	13.6	13.2	734.	1390.	3.63	11.5	.6	191.	196	-1.52	6.146	15.720	3.948	123.79
135	981815.0	103620.	2000	160	.9	13.6	13.2	733.	1398.	3.61	11.5	.6	191.	196	-1.52	6.137	15.540	3.935	123.79
136	981815.0	103624.	2000	160	.9	13.6	13.2	732.	1395.	3.61	11.5	.6	192.	196	-1.52	6.138	15.538	3.933	123.79
137	981815.0	103628.	2000	160	.9	13.6	13.1	732.	1403.	3.63	11.5	.6	192.	196.	-1.52	6.142	15.590	3.947	123.79
138	981815.0	103632.	2000	160	.9	13.6	13.1	732.	1404.	3.65	11.5	.6	191	196.	-1.53	6.162	15.670	3.970	123.79
139	982616.0	104130.	2500	159	.9	13.4	13.1	730.	1227.	4.13	11.2	.7	187.	199.	-1.97	7.936	16.810	5.457	123.79
140	982616.0	104134.	2500	159	.8	13.4	13.1	729.	1224.	4.14	11.2	.6	187.	200.	-1.98	7.951	15.660	5.157	123.79
141	982616.0	104138.	2500	159	.8	13.4	13.1	728.	1224.	4.14	11.1	.6	189.	199.	-1.96	7.913	15.800	5.148	123.79
142	982616.0	104144.	2500	159	.8	13.4	13.2	727.	1231.	4.14	11.1	.6	192.	199.	-1.96	7.902	15.460	5.398	123.79
143	982616.0	104205.	2500	157	1.0	13.4	13.2	726.	1232.	4.10	11.2	.6	188.	199.	-1.94	7.027	15.370	5.102	123.79
144	982616.0	104214.	2500	157	1.1	13.4	13.1	725.	1230.	4.07	11.2	.6	188.	200	-1.95	7.848	14.850	5.168	123.79
145	982616.0	104219.	2500	157	1.0	13.4	13.1	724.	1239.	4.09	11.2	.6	189.	200.	-1.95	7.861	14.780	5.157	123.79
146	982616.0	104223.	2500	158	1.1	13.4	13.1	724.	1243.	4.09	11.2	.6	191.	200.	-1.96	7.889	14.900	5.094	123.79
147	982616.0	104227.	2500	158	1.1	13.4	13.1	725.	1242.	4.10	11.2	.6	193.	200.	-1.94	7.834	15.070	5.105	123.79
148	982616.0	104231.	2500	158	1.1	13.4	13.1	725.	1245.	4.12	11.2	.6	193.	199.	-1.95	7.839	15.420	5.148	123.79
149	982616.0	104235	2500	158	1.1	13.4	13.1	726.	1237.	4.15	11.2	.6	192	199.	-1.95	7.830	15.760	5.139	123.79
150	982616.0	104239.	2500	158	1.1	13.4	13.1	727.	1233.	4.13	11.2	.6	190.	199.	-1.94	7.822	15.910	5.094	123.79
151	982616.0	104243.	2500	158	1.1	13.4	13.1	727.	1235.	4.11	11.2	.6	188	199	-1.94	7.820	16.120	5.117	123.79
152	982616.0	104247.	2500	158	1.0	13.4	13.1	728.	1231.	4.11	11.2	.6	187.	200.	-1.94	7.820	16.140	5.136	123.79
153	982716.0	104626.	2500	122	3.9	14.3	13.8	719.	1060.	2.34	12.3	.9	193.	200.	-1.61	6.471	15.920	3.971	123.79
154	982716.0	104630.	2500	121	3.8	14.3	13.8	719.	1061.	2.32	12.3	.9	192.	200.	-1.61	6.481	15.790	3.969	123.79
155	982716.0	104634.	2500	121	3.8	14.4	13.8	719.	1060.	2.31	12.3	.9	191.	199.	-1.61	6.490	15.750	3.977	123.79
156	982716.0	104638.	2500	121	3.8	14.3	13.8	718.	1063.	2.32	12.3	.9	189.	200	-1.61	6.474	15.670	3.990	123.79
157	982716.0	104642.	2500	121	3.8	14.4	13.8	718.	1056.	2.29	12.4	.9	188.	200.	-1.61	6.476	15.370	3.964	123.79
158	982716.0	104658.	2500	121	3.8	14.4	13.8	717.	1066.	2.28	12.4	.9	191.	200.	-1.60	6.450	15.790	3.983	123.79

TABLE B-1. CHRYSLER 225 CID TEST DATA (CONTD)

REC NUM	NOMINAL CODE	TIME HHMMSS	RPM RPM	CTORQ LB-FT	EGR %	A/FEX	A/FTC LB/HR	CNOX PPM	HC PPM	CO %	CO2 %	O2 %	COOLE DEG-F	EXOIL DEG-F	AIRDP INH2O	AIRFLO LB/MIN	ABSHUM GR/LB	FLO G/S	DATE JUL.YR
159	982716 0	104702	2500	121	3 0	14.3	13.8	718.	1078.	2.33	12.3	.8	192.	200	-1.61	6.465	16.110	3.962	123.79
160	982716 0	104707	2500	121	3 8	14.3	13 8	720.	1050.	2 33	12 3	.8	192.	200	-1.63	6 549	16.260	3.963	123.79
161	982716 0	104711	2500	121	3 8	14 4	13 8	719.	1069.	2 28	12.4	.8	192	199.	-1.62	6.509	16.320	3.978	123.79
162	982716 8	104714	2500	121	3.8	14 3	13 8	719.	1046	2 32	12.3	.8	190.	200	-1 61	6 473	16 430	3 973	123.79
163	982816 8	105213.	2500	85	5 6	15.6	15.1	707.	530.	.54	13.1	1.5	190.	199.	-1.32	5.301	16 700	3.061	123.79
164	982816.0	105217.	2500	84	5 6	15.6	15.1	707.	513.	.50	13.1	1.5	191.	199.	-1.32	5.289	16.970	3.050	123.79
165	982816.0	105221.	2500	85	5 6	15.6	15.1	708.	511.	.59	13.1	1.5	192.	199	-1.33	5.328	17.000	3.030	123.79
166	982816 0	105225	2500	85	5 6	15 6	15 1	708.	530.	.57	13.1	1 5	192.	199.	-1.32	5.304	17.100	3 051	123.79
167	982816.0	105229.	2500	84	5 6	15 6	15.1	708.	527.	.56	13.1	1 5	191	199	-1.33	5.323	17.210	3.051	123.79
168	982816 0	105252.	2500	85	5 6	15.7	15.1	708	533.	.50	13 1	1 5	190.	199.	-1.32	5.314	17.140	3.037	123.79
169	982816 0	105256.	2500	85	5 6	15.7	15.1	707.	520.	.57	13.1	1.5	192.	199.	-1.33	5.322	17.040	3.024	123.79
170	982816 0	105300.	2500	84	5.6	15 7	15.1	707.	509.	.59	13.2	1.5	192.	199.	-1.32	5.278	17.230	2.950	123.79
171	982816.0	105304.	2500	84	5.7	15.7	15.1	707.	534.	.61	13.1	1.5	192.	199.	-1.32	5.272	17.040	2.963	123.79
172	982816 0	105308.	2500	84	5.6	15 7	15.1	708	547	.59	13.1	1.5	191.	199.	-1.32	5.273	16.810	3.142	123.79
173	982916 0	110424.	2500	42	8 1	16.2	15.5	374.	291.	.40	13.1	2 1	196	196.	- .90	3.934	17.000	1.998	123.79
174	982916 0	110428.	2500	42	8.2	16.2	15.5	370	288.	.41	13.1	2.0	195.	196.	- .99	3.959	16.870	2.007	123.79
175	982916 0	110432.	2500	42	8.1	16.2	15.5	353.	252.	.41	13.2	2.0	195.	197.	- .98	3.949	16.760	1.994	123.79
176	982916.8	110436.	2500	42	8 1	16 2	15.5	346.	260.	.37	13 2	2.0	195.	197.	- .98	3.924	16.890	1 996	123.79
177	982916 0	110440.	2500	42	8.2	16.2	15 5	351	257	.38	13 2	2.0	195.	197.	- .98	3.927	17.120	1.992	123.79
178	982916.0	110502.	2500	40	8.1	16.2	15.5	355.	254.	.37	13.1	2.0	193.	197.	- .97	3.891	17.330	1.953	123.79
179	982916 0	110511.	2500	41	8.2	16.2	15.5	339.	233.	.38	13.1	2.0	193.	197.	- .97	3.900	17.300	1.946	123.79
180	982916 0	110515.	2500	40	8.3	16.2	15.5	327.	241	.30	13.1	2.0	193.	197.	- .97	3.890	17.400	2.036	123.79
181	982916.0	110522.	2500	41	8.2	16.2	15.5	329.	242.	.37	13.2	2.0	194.	197.	- .97	3.895	17.450	2.130	123.79
182	982916.0	110526.	2500	41	8.2	16.2	15.5	332.	245.	.37	13.2	2.0	194.	197.	- .97	3.894	17.420	2.099	123.79
183	983016 8	110927.	2500	3	10.1	16.3	15.4	101.	664.	.35	13 0	2.2	190.	196.	- .65	2.613	17.560	.645	123.79
184	983016 8	110931.	2500	3	10.1	16.3	15.3	102.	700.	.35	13.0	2.2	190.	196.	- .65	2.609	17.750	.528	123.79
185	983016.0	110935.	2500	3	10.1	16.3	15.3	102.	792.	.34	13.0	2.2	190.	196.	- .65	2.616	17.740	.324	123.79
186	983016.8	110939.	2500	3	10.1	16.3	15.5	102.	676.	.31	13.0	2.2	190.	196.	- .66	2.619	17.590	.073	123.79
187	983016.8	110944.	2500	3	10.1	16.3	15.4	102.	729.	.33	13.0	2.2	190.	196	- .65	2.615	17.330	.264	123.79
188	983016.0	111025.	2500	3	10.2	16.4	15.4	97.	781.	.30	12.9	2.3	190.	196.	- .65	2.591	17.470	.628	123.79
189	983016.8	111029.	2500	3	10.2	16.4	15.5	98.	739.	.32	12 9	2.3	190.	196.	- .65	2.591	17.380	.555	123.79
190	983016 0	111033.	2500	2	10.2	16.4	15.6	100.	589.	.33	12.9	2.3	190.	196.	- .65	2.595	17.560	.281	123.79
191	983016.0	111037.	2500	3	10.2	16.3	15.5	100.	622.	.33	12.9	2.3	190.	196.	- .65	2.602	17.670	.372	123.79
192	983016.0	111041.	2500	3	10.2	16.3	15.4	101.	762.	.34	13.0	2.3	190.	196.	- .65	2.597	17.560	1.602	123.79
193	980715.0	112047.	1500	161	.8	13 6	12.9	723.	1631.	4.09	11.2	1.0	192.	193.	-1.13	4.308	18.070	2.246	123.79
194	980715.0	112054.	1500	161	.0	13.6	12.9	724.	1631.	4.12	11.1	1.0	191.	193.	-1.13	4.346	18.320	2.205	123.79
195	980715.0	112058.	1500	161	.8	13 6	13.0	723.	1632.	4 11	11.1	1 0	191.	193.	-1.14	4.360	18.450	2.301	123.79
196	980715.0	112102.	1500	161	.0	13.6	13.0	722.	1620	4.12	11.1	1 0	190	193.	-1.14	4.335	18.320	2.261	123.79
197	980715.0	112106.	1500	161	.8	13.6	13.0	721.	1630.	4.11	11.1	1 0	190.	193.	-1 14	4.373	18.350	2.157	123.79
198	980715.0	112110.	1500	161	.0	13.6	13.0	722.	1615.	4.12	11 1	.9	189.	193.	-1 15	4.592	18.230	2.215	123.79
199	980715.0	112125.	1500	162	.8	13.6	13.0	720.	1625.	4.11	11.1	.9	189.	193.	-1.14	4.363	17.370	2.179	123.79
200	980716.8	112129.	1500	162	.0	13 6	13.0	719.	1610.	4.09	11 1	.9	189.	193.	-1.14	4.374	17.400	2.304	123.79
201	980715.0	112154.	1500	161	.8	13.6	13.0	721.	1624.	4 03	11 2	.9	192.	193.	-1 14	4.383	17.390	2.100	123.79
202	980715.0	112204.	1500	160	.0	13.6	12.9	719.	1630.	4.00	11.2	.9	190.	193.	-1.13	4.329	17.940	2.005	123.79
203	980814.0	112909.	1500	121	5.3	15.7	14.6	720.	1072.	.73	13.0	1.8	188.	193.	- .93	3.728	18.030	2.015	123.79
204	980814.0	112913.	1500	121	5.3	15 7	14.6	721.	1071.	.72	13.0	1.8	188.	193.	- .93	3.725	17.938	2.579	123.79
205	980814.0	112918.	1500	121	5.3	15.7	14.6	721.	1078.	.76	13 0	1.8	189.	193.	- 93	3.731	17.830	2.490	123.79
206	980814.0	112922.	1500	121	5.4	15.7	14.6	720.	1060.	.79	13 0	1.8	189.	193.	- .93	3.739	17.930	2.177	123.79
207	980814.8	112926.	1500	121	5.3	15.7	14 6	721.	1057.	.75	13.0	1.8	190.	192.	- 93	3.715	18.100	2.103	123.79
200	980814.0	112950.	1500	121	5.3	15 7	14.6	720.	1065.	.76	13.0	1 8	191.	192.	- 93	3.730	17.530	2.005	123.79
209	980814 0	112955.	1500	121	5.4	15 7	14 7	720.	1064.	71	13.0	1.8	191.	192	- .93	3.714	17.800	2.121	123.79
210	980814.8	112959	1500	121	5.3	15 7	14 6	721.	1067.	72	13 1	1.8	190.	192.	- .94	3.750	17.710	2.505	123.79
211	980814 0	113003.	1500	121	5.3	15 7	14 6	722	1066	76	13 0	1 8	189.	192.	- .94	3.746	17 680	2.347	123 79
212	980814.8	113009	1500	121	5.3	15.7	14.6	720	1081.	.76	13.0	1.8	189.	192.	- .93	3.724	17.560	2.261	123.79
213	980814 0	135007.	1401	120	5 2	15 4	15 0	738	1132	55	12 9	1.3	189.	190	- 88	3.500	22.040	1.991	123.79

TABLE B-1. CHRYSLER 225 CID TEST DATA (CONTD)

REC NUM	NOMINAL CODE	TIME HHMMSS	RPM RPM	TORQ LB-FT	EGR %	A/FEX	A/FTC LB/HR	CNOX PPM	HC PPM	CO %	CO2 %	O2 %	COOLE DEG-F	EXOIL DEG-F	AIRDP INH2O	AIRFLO LB/MIN	ABSHUM GR/LB	FLO G/S	DATE JUL.YR
214	980814.0	135012	1401	120	5.2	15.5	15.0	737.	1112.	.55	12.9	1.3	189.	190.	-.89	3.540	21.960	2.016	123.79
215	980814.0	135016	1401	120	5.2	15.5	15.0	737.	1114.	.54	12.9	1.3	189.	190.	-.89	3.539	21.840	2.018	123.79
216	980814.0	135020	1400	121	5.2	15.5	14.9	737.	1110.	.56	12.9	1.3	190.	190.	-.89	3.527	21.710	2.027	123.79
217	980814.0	135024	1400	121	5.1	15.5	15.0	737.	1115.	.54	12.9	1.3	190.	190.	-.89	3.524	21.670	2.035	123.79
218	980814.0	135400	1400	121	5.4	15.3	14.7	731.	1160.	.80	12.9	1.2	190.	191.	-.89	3.536	21.280	2.037	123.79
219	980814.0	135404	1400	121	5.4	15.2	14.6	730.	1171.	.81	12.9	1.2	190.	190.	-.89	3.552	21.250	2.026	123.79
220	980814.0	135408	1400	122	5.3	15.2	14.6	730.	1171.	.82	12.9	1.2	191.	190.	-.90	3.570	21.470	2.035	123.79
221	980814.0	135412	1401	122	5.3	15.2	14.6	731.	1167.	.81	12.9	1.1	191.	190.	-.89	3.548	21.600	2.029	123.79
222	980814.0	135416	1403	121	5.4	15.2	14.6	731.	1150.	.83	12.9	1.1	191.	190.	-.89	3.527	21.030	2.039	123.79
223	980913.0	140039	1500	82	8.4	16.2	15.9	698.	684.	.18	12.8	2.0	190.	191.	-.81	3.108	22.380	1.730	123.79
224	980913.0	140044	1500	82	8.4	16.2	15.8	696.	663.	.20	12.8	2.0	190.	191.	-.80	3.100	22.420	1.675	123.79
225	980913.0	140048	1500	83	8.4	16.2	15.9	696.	658.	.19	12.8	2.0	190.	191.	-.80	3.173	22.470	1.702	123.79
226	980913.0	140052	1500	83	8.4	16.2	15.9	699.	647.	.17	12.8	2.0	190.	191.	-.80	3.173	22.360	1.727	123.79
227	980913.0	140056	1500	83	8.3	16.2	15.9	696.	653.	.18	12.8	2.0	190.	191.	-.80	3.102	22.210	1.736	123.79
228	980913.0	140120	1500	82	8.4	16.2	15.9	697.	658.	.19	12.7	1.9	190.	191.	-.81	3.202	21.370	1.726	123.79
229	980913.0	140124	1499	82	8.4	16.2	15.9	695.	676.	.18	12.8	1.9	190.	191.	-.81	3.204	21.360	1.693	123.79
230	980913.0	140128	1500	81	8.4	16.2	15.9	696.	674.	.17	12.7	1.9	190.	191.	-.80	3.179	21.830	1.715	123.79
231	980913.0	140132	1500	82	8.4	16.2	15.9	697.	654.	.17	12.7	1.9	190.	191.	-.81	3.198	21.700	1.712	123.79
232	980913.0	140136	1500	82	8.3	16.2	15.9	698.	673.	.17	12.7	2.0	190.	191.	-.81	3.194	21.500	1.602	123.79
233	981013.0	141515	1500	44	11.2	17.5	16.0	116.	2570.	.21	11.3	3.6	190.	190.	-.69	2.740	22.390	1.300	123.79
234	981013.0	141519	1500	44	11.1	17.5	15.9	119.	2631.	.21	11.3	3.6	190.	190.	-.70	2.735	22.300	1.353	123.79
235	981013.0	141523	1500	44	11.1	17.5	15.9	126.	2715.	.21	11.2	3.7	190.	190.	-.70	2.750	22.300	1.363	123.79
236	981013.0	141527	1500	43	11.0	17.5	15.9	132.	2683.	.21	11.2	3.7	190.	190.	-.70	2.752	22.410	1.393	123.79
237	981013.0	141531	1500	44	11.0	17.6	16.2	132.	2363.	.21	11.2	3.7	190.	190.	-.70	2.761	22.530	1.367	123.79
238	981013.0	141535	1499	43	11.0	17.6	16.1	129.	2551.	.21	11.2	3.7	190.	190.	-.70	2.775	22.660	1.283	123.79
239	981013.0	141614	1500	40	11.1	17.5	15.9	127.	2669.	.22	11.3	3.7	190.	190.	-.67	2.671	22.300	1.297	123.79
240	981013.0	141618	1500	41	11.1	17.4	15.7	123.	2845.	.22	11.3	3.6	190.	190.	-.68	2.680	22.200	1.284	123.79
241	981013.0	141625	1500	43	11.3	17.4	15.8	123.	2761.	.22	11.3	3.6	190.	190.	-.68	2.700	22.530	1.362	123.79
242	981013.0	141629	1500	43	11.4	17.5	16.0	116.	2575.	.21	11.3	3.6	190.	190.	-.69	2.720	22.560	1.360	123.79
243	981013.0	141633	1500	43	11.3	17.4	15.9	110.	2738.	.21	11.3	3.6	190.	190.	-.69	2.723	22.520	1.412	123.79
244	981113.0	142023	1501	4	16.5	17.2	1.8	20.	13890.	.45	9.9	5.1	189.	188.	-.41	1.622	21.780	.887	123.79
245	981113.0	142027	1500	4	16.5	17.2	1.8	19.	14040.	.42	9.9	5.1	189.	189.	-.41	1.626	21.740	.836	123.79
246	981113.0	142031	1500	4	16.8	17.2	1.8	19.	14040.	.42	9.9	5.1	189.	189.	-.41	1.628	21.680	.836	123.79
247	981113.0	142035	1500	5	16.0	17.2	1.8	19.	13860.	.43	9.8	5.1	189.	189.	-.41	1.625	21.060	.921	123.79
248	981113.0	142039	1500	5	16.7	17.3	1.8	19.	13730.	.44	9.9	5.2	189.	189.	-.41	1.626	22.030	.881	123.79
249	981113.0	142110	1500	1	16.7	17.2	1.8	20.	14670.	.43	9.8	5.2	189.	188.	-.39	1.557	22.560	.813	123.79
250	981113.0	142128	1500	2	16.8	17.2	1.8	17.	14380.	.47	9.8	5.3	189.	188.	-.40	1.565	22.920	.868	123.79
251	981113.0	142132	1500	2	16.9	17.2	1.8	17.	14450.	.47	9.8	5.2	189.	188.	-.39	1.568	23.020	.832	123.79
252	981113.0	142138	1500	3	16.9	17.1	1.8	17.	14420.	.47	9.8	5.2	189.	188.	-.40	1.561	23.180	.833	123.79
253	981113.0	142143	1500	2	16.8	17.1	1.8	18.	14100.	.51	9.9	5.2	189.	188.	-.39	1.556	23.160	.882	123.79
254	981113.0	142147	1500	2	16.8	17.0	1.8	18.	14510.	.48	9.8	5.1	189.	188.	-.39	1.551	23.160	.794	123.79
255	983417.0	142925	2998	158	.7	13.3	13.6	729.	949.	3.81	11.2	.3	190.	200.	-2.54	9.893	25.800	6.275	123.79
256	983417.0	142929	2996	158	.7	13.3	13.6	729.	940.	3.82	11.1	.3	190.	200.	-2.52	9.835	25.850	6.238	123.79
257	983417.0	142938	2999	158	.7	13.3	13.6	728.	955.	3.81	11.1	.3	190.	201.	-2.54	9.884	25.810	6.159	123.79
258	983417.0	142942	2999	157	.7	13.3	13.6	729.	954.	3.83	11.1	.2	190.	201.	-2.53	9.841	26.040	6.278	123.79
259	983417.0	142946	2997	157	.7	13.3	13.6	729.	954.	3.86	11.1	.2	190.	201.	-2.53	9.854	26.090	6.304	123.79
260	983417.0	143019	3000	158	.6	13.2	13.6	728.	941.	3.84	11.1	.2	190.	201.	-2.55	9.935	26.320	6.256	123.79
261	983417.0	143023	3000	158	.7	13.2	13.6	727.	926.	3.82	11.1	.2	190.	201.	-2.53	9.848	25.960	6.349	123.79
262	983417.0	143027	3000	158	.7	13.2	13.6	727.	920.	3.82	11.1	.2	190.	201.	-2.53	9.859	26.030	6.309	123.79
263	983417.0	143031	3000	157	.7	13.2	13.6	727.	914.	3.86	11.1	.2	190.	201.	-2.54	9.879	25.910	6.327	123.79
264	983417.0	143035	3000	157	.7	13.2	13.7	725.	900.	3.84	11.1	.2	190.	201.	-2.53	9.842	25.760	6.304	123.79
265	983517.0	143242	3000	118	3.5	14.0	14.2	711.	815.	2.27	12.1	.3	190.	201.	-2.05	7.981	25.150	4.830	123.79
266	983517.0	143246	3000	118	3.5	14.0	14.3	710.	817.	2.22	12.1	.3	189.	201.	-2.03	7.936	24.960	4.798	123.79
267	983517.0	143250	3000	117	3.5	14.0	14.2	710.	796.	2.23	12.1	.3	189.	201.	-2.03	7.983	24.970	4.796	123.79
268	983517.0	143254	3000	117	3.6	14.0	14.3	710.	793.	2.25	12.1	.3	189.	201.	-2.04	7.973	24.900	4.776	123.79

TABLE B-1. CHRYSLER 225 CID TEST DATA (CONTD)

REC NUM	NOMINAL CODE	TIME HHMMSS	RPM RPM	CTORQ LB-FT	EGR %	A/FEX	A/FTC LB/HR	CNOX PPM	HC PPM	CO %	CO2 %	O2 %	COOLE DEG-F	EXOIL DEG-F	AIRDP INH2O	AIRFLO LB/MIN	ABSNUM GR/LB	FLO G/S	DATE JUL.YR
269	983517.8	143256.	3000	110	3.6	14.1	14.3	789.	776.	2.20	12.1	.3	189.	201.	-2.03	7.923	24.730	4.826	123.79
270	983517.8	143311.	3000	117	3.6	14.1	14.3	707.	778.	2.20	12.1	.4	198.	201.	-2.03	7.921	24.548	4.773	123.79
271	983517.8	143315.	3000	117	3.6	14.1	14.3	706.	772.	2.21	12.1	.4	189.	201.	-2.02	7.893	24.340	4.781	123.79
272	983517.8	143319.	3000	117	3.6	14.1	14.3	705.	787.	2.22	12.1	.4	189.	201.	-2.03	7.912	24.310	4.771	123.79
273	983517.8	143323.	3000	117	3.6	14.1	14.3	704.	810.	2.23	12.1	.4	189.	201.	-2.02	7.886	24.430	4.797	123.79
274	983517.8	143327.	3000	117	3.6	14.1	14.3	704.	816.	2.22	12.1	.4	189.	201.	-2.01	7.869	24.300	4.706	123.79
275	983617.8	143726.	3000	77	4.7	16.2	16.8	695.	37.	.04	12.6	1.7	190.	201.	-1.73	6.736	25.300	3.569	123.79
276	983617.8	143829.	3800	77	4.7	16.0	16.5	695.	35.	.06	12.9	1.5	190.	201.	-1.70	6.620	25.430	3.509	123.79
277	983617.8	143833.	3000	77	4.7	16.0	16.5	694.	36.	.06	12.8	1.5	190.	201.	-1.70	6.619	25.360	3.549	123.79
278	983617.8	143837.	3808	78	4.8	16.0	16.5	693.	36.	.06	12.8	1.4	190.	201.	-1.72	6.679	25.270	3.554	123.79
279	983617.8	143841.	3800	77	4.7	16.0	16.5	693.	35.	.06	12.8	1.5	190.	201.	-1.72	6.702	25.400	3.586	123.79
280	983617.8	143845.	3008	76	4.7	16.8	16.5	694.	33.	.06	12.8	1.5	198.	201.	-1.72	6.673	25.270	3.591	123.79
281	983617.8	143937.	3000	78	4.7	16.2	16.8	694.	28.	.04	12.6	1.7	189.	201.	-1.75	6.787	25.740	3.532	123.79
282	983617.8	143941.	3800	77	4.7	16.2	16.8	693.	28.	.04	12.6	1.7	189.	201.	-1.75	6.794	25.800	3.555	123.79
283	983617.8	143945.	3000	77	4.7	16.2	16.8	695.	28.	.04	12.6	1.7	190.	201.	-1.74	6.763	25.960	3.617	123.79
284	983617.8	143949.	3808	78	4.7	16.2	16.8	693.	28.	.04	12.6	1.7	190.	201.	-1.74	6.733	25.930	3.573	123.79
285	983617.8	143953.	3000	78	4.7	16.2	16.8	693.	28.	.05	12.6	1.7	190.	201.	-1.73	6.714	25.700	3.593	123.79
286	983717.8	144328.	3800	41	6.1	16.3	16.7	475.	25.	.04	12.7	1.8	190.	201.	-1.32	5.092	24.040	2.839	123.79
287	983722.8	144753.	3000	48	6.5	16.0	16.7	620.	19.	.07	12.6	1.5	190.	208.	-1.24	4.747	27.090	2.455	123.79
288	983722.8	144757.	3000	48	6.5	16.1	16.8	599.	19.	.06	12.6	1.6	190.	208.	-1.24	4.765	26.990	2.504	123.79
289	983722.8	144801.	3000	41	6.5	16.2	16.8	552.	19.	.07	12.6	1.8	189.	208.	-1.24	4.765	26.980	2.507	123.79
290	983722.8	144824.	3008	42	6.5	16.2	16.6	555.	28.	.08	12.8	1.7	189.	208.	-1.22	4.711	25.920	2.490	123.79
291	983722.8	144827.	3000	41	6.5	16.1	16.6	563.	20.	.08	12.8	1.7	189.	208.	-1.22	4.711	25.740	2.537	123.79
292	983722.8	144832.	3808	42	6.5	16.1	16.5	558.	19.	.08	12.8	1.6	189.	208.	-1.22	4.722	25.550	2.470	123.79
293	983822.8	145912.	3800	4	7.5	15.7	15.7	138.	174.	.30	13.1	1.3	190.	198.	-.80	3.039	25.130	1.743	123.79
294	983822.8	145916.	3800	4	7.5	15.7	15.7	141.	172.	.32	13.1	1.3	190.	198.	-.80	3.056	24.870	1.710	123.79
295	983822.8	145920.	3000	4	7.5	15.7	15.7	142.	193.	.32	13.1	1.3	190.	198.	-.80	3.036	24.830	1.723	123.79
296	983822.8	145924.	3008	4	7.5	15.7	15.7	141.	176.	.31	13.1	1.3	190.	198.	-.80	3.058	24.590	1.711	123.79
297	983822.8	145928.	3000	4	7.5	15.7	15.7	138.	195.	.31	13.1	1.3	190.	198.	-.80	3.038	24.830	1.696	123.79
298	983822.8	145944.	3008	3	7.6	15.7	15.7	138	179.	.30	13.1	1.3	190.	198.	-.80	3.065	24.980	1.689	123.79
299	983822.8	145948.	3000	3	7.5	15.7	15.7	137.	192.	.30	13.1	1.3	190.	198.	-.80	3.065	25.170	1.741	123.79
308	983822.8	145956.	3000	4	7.6	15.7	15.7	137.	201.	.34	13.1	1.3	190.	198.	-.80	3.065	25.280	1.738	123.79
381	983822.8	150002.	3000	5	7.6	15.7	15.7	136.	183.	.33	13.1	1.3	190.	198.	-.80	3.061	25.170	1.714	123.79
382	984223.8	151008.	3596	140	1.4	13.4	13.6	690.	975.	3.70	11.2	.4	190.	208.	-2.84	10.988	27.510	6.069	123.79
383	984223.8	151012.	3595	140	1.4	13.4	13.6	689.	969.	3.72	11.2	.4	190.	208.	-2.85	10.930	27.790	6.070	123.79
384	984223.8	151016.	3594	140	1.4	13.4	13.6	690.	962.	3.72	11.2	.4	190.	208.	-2.84	10.918	27.760	6.809	123.79
385	984223.8	151034.	3593	140	1.4	13.4	13.6	689.	964.	3.72	11.2	.4	190.	208.	-2.87	11.010	27.650	6.861	123.79
386	984223.8	151038.	3592	140	1.4	13.4	13.6	689.	959.	3.69	11.2	.4	190.	208.	-2.87	10.990	27.690	6.813	123.79
387	984223.8	151049.	3597	140	1.4	13.5	13.7	690.	928.	3.64	11.3	.4	190.	208.	-2.85	10.980	28.150	6.825	123.79
388	984223.8	151053.	3596	140	1.4	13.5	13.7	691	953	3.62	11.3	.4	198.	208.	-2.85	10.910	28.220	6.815	123.79
389	984223.8	151057.	3594	140	1.4	13.5	13.6	690.	930	3.64	11.3	.4	190.	208.	-2.87	11.080	28.050	6.818	123.79
310	984223.8	151101.	3596	140	1.4	13.5	13.7	690.	927	3.57	11.3	.4	190.	208.	-2.88	11.040	28.180	6.799	123.79
311	984223.8	151105.	3599	140	1.4	13.5	13.7	690.	949.	3.57	11.3	.4	190.	208.	-2.88	10.940	27.780	6.801	123.79
312	984323.8	151457	3600	106	3.8	13.7	13.9	680.	966	3.06	11.6	.5	189.	208.	-2.34	8.973	28.110	5.428	123.79
313	984323.8	151503.	3600	106	3.9	13.7	13.9	678.	957	3.10	11.5	.5	189.	208.	-2.34	8.978	28.180	5.605	123.79
314	984323.8	151507.	3608	106	3.9	13.7	13.9	678.	949.	3.10	11.6	.5	189.	208.	-2.36	9.020	28.320	5.499	123.79
315	984323.8	151511.	3600	106	3.9	13.7	13.9	680.	938	3.08	11.6	.5	189.	208.	-2.36	9.019	28.410	5.344	123.79
316	984323.8	151515.	3600	107	3.9	13.7	13.9	681.	952.	3.07	11.6	.5	190.	208.	-2.36	9.824	28.530	5.298	123.79
317	984323.8	151538.	3600	106	3.9	13.8	13.9	679.	920.	3.00	11.6	.5	190.	208.	-2.34	8.961	27.730	5.258	123.79
318	984323.8	151548.	3600	106	3.9	13.8	14.0	679.	912.	2.93	11.7	.5	189.	208.	-2.32	8.881	27.830	5.134	123.79
319	984323.8	151552.	3600	106	3.9	13.8	14.0	677.	913.	2.91	11.6	.5	190.	208.	-2.31	8.865	27.440	5.320	123.79
320	984323.8	151557.	3608	107	3.9	13.8	14.0	677.	943.	2.90	11.7	.5	190.	208.	-2.36	9.037	27.618	5.296	123.79
321	984323.8	151600.	3600	107	3.9	13.8	13.9	678.	942.	2.95	11.7	.5	190.	208.	-2.35	9.020	27.720	5.345	123.79
322	984423.8	152046	3600	70	4.4	15.6	16.1	678.	56.	.17	13.0	1.0	190.	207.	-1.90	7.264	29.570	4.017	123.79
323	984423.8	152054.	3600	70	4.4	15.6	16.1	678.	50.	.18	13.0	1.0	190.	207.	-1.91	7.285	29.450	4.040	123.79

TABLE B-1. CHRYSLER 225 CID TEST DATA (CONTD)

REC NUM	NOMINAL CODE	TIME HHMMSS.	RPM RPM	CTORQ LB-FT	EGR %	A/FEX	A/FTC LB/HR	CNOX PPM	HC PPM	CO %	CO2 %	O2 %	COOLE DEG-F	EXOIL DEG-F	AIRDP INH20	AIRFLO LB/MIN	ABSNUM GR/LB	FLO G/S	DATE JUL.YR
324	984423.0	152858.	3600	69	4.4	15.6	16.1	676.	50.	.10	13.0	1.0	190.	207.	-1.98	7.264	29.290	3.983	123.79
325	984423.0	152102.	3600	68	4.4	15.6	16.1	677.	46.	.18	13.0	1.0	190.	207.	-1.91	7.307	29.070	3.956	123.79
326	984423.0	152106.	3599	69	4.4	15.6	16.1	677.	54.	.17	13.0	1.0	190.	207.	-1.91	7.282	29.190	3.967	123.79
327	984423.0	152124.	3600	68	4.4	15.5	16.0	673.	54.	.19	13.0	1.0	190.	207.	-1.91	7.293	29.530	3.997	123.79
328	984423.0	152128.	3600	68	4.4	15.5	16.1	673.	45.	.18	13.0	1.0	190.	207.	-1.89	7.252	29.670	4.002	123.79
329	984423.0	152132.	3600	69	4.5	15.5	16.1	674.	48.	.17	13.1	1.0	190.	207.	-1.87	7.176	29.300	3.910	123.79
330	984423.0	152136.	3600	69	4.4	15.5	16.1	675.	53.	.16	13.1	1.0	190.	207.	-1.88	7.204	29.420	3.907	123.79
331	984423.0	152140.	3600	68	4.4	15.5	16.1	673.	52.	.18	13.0	1.0	190.	207.	-1.89	7.245	29.520	3.935	123.79
332	984524.0	152723.	3600	37	5.4	16.1	16.7	620.	20.	.05	12.7	1.6	190.	206.	-1.47	5.616	29.390	2.041	123.79
333	984524.0	152729.	3600	38	5.4	16.1	16.7	618	19.	.06	12.7	1.6	190.	206.	-1.47	5.614	29.990	3.061	123.79
334	984524.0	152741.	3600	35	5.4	16.1	16.7	646.	19.	.05	12.7	1.6	190.	206.	-1.46	5.504	28.720	2.873	123.79
335	984524.0	152745.	3600	35	5.4	16.1	16.7	653.	19.	.05	12.7	1.6	190.	206.	-1.45	5.502	28.620	3.147	123.79
336	984524.0	152749.	3600	35	5.3	16.1	16.6	658.	19.	.05	12.7	1.6	190.	206.	-1.45	5.504	28.660	2.961	123.79
337	984524.0	152753.	3599	36	5.3	16.1	16.6	634.	19.	.05	12.7	1.6	190.	206.	-1.46	5.602	28.980	3.142	123.79
338	984524.0	152810	3600	36	5.4	16.0	16.6	636.	19.	.05	12.7	1.5	190.	206.	-1.45	5.555	28.710	2.913	123.79
339	984524.0	152814.	3600	36	5.4	16.0	16.6	641	19.	.05	12.8	1.5	190.	206.	-1.45	5.551	28.820	2.824	123.79
340	984524.0	152818	3600	36	5.4	16.0	16.7	639.	19.	.05	12.7	1.5	190.	206.	-1.46	5.582	28.650	3.059	123.79
341	984524.0	152822.	3600	37	5.4	16.1	16.7	635.	19.	.05	12.7	1.5	190.	206.	-1.45	5.568	28.810	2.880	123.79
342	984524.0	152826.	3600	37	5.4	16.1	16.6	632.	19.	.06	12.7	1.6	190.	206.	-1.44	5.542	28.860	2.890	123.79
343	985022.0	153542.	3000	120	3.9	14.2	14.1	606.	974.	2.59	11.8	.9	190.	202.	-2.00	7.668	29.540	4.670	123.79
344	985023.0	153546.	3000	120	3.9	14.2	14.1	685.	1004.	2.50	11.8	.9	190.	202.	-1.99	7.636	29.430	4.707	123.79
345	985023.0	153550.	3000	120	3.9	14.2	14.0	685.	1002.	2.64	11.8	.9	190.	201.	-1.99	7.642	29.320	4.732	123.79
346	985023.0	153554.	3000	120	3.9	14.2	14.0	684.	989.	2.65	11.8	.9	190.	202.	-1.99	7.654	29.140	4.718	123.79
347	985023.0	153558.	3000	120	3.9	14.2	14.0	684.	988.	2.64	11.8	.9	190.	202.	-2.00	7.682	28.820	4.749	123.79
348	985023.0	153611.	3000	120	3.9	14.2	14.0	682.	982.	2.65	11.8	.9	190.	202.	-2.00	7.661	29.050	4.735	123.79
349	985023.0	153615.	3000	121	3.9	14.2	14.0	683.	986.	2.67	11.8	.9	190.	202.	-2.00	7.681	29.410	4.725	123.79
350	985023.0	153619.	3000	121	3.9	14.2	14.0	685.	1008.	2.66	11.8	.9	190.	202.	-2.01	7.696	29.340	4.715	123.79
351	985023.0	153626.	3000	121	3.9	14.2	14.0	685.	1007.	2.66	11.8	.9	189.	202.	-2.01	7.687	29.320	4.726	123.79
352	985023.0	153630.	3000	121	3.9	14.2	14.0	684.	1000.	2.67	11.8	.8	190.	202.	-2.00	7.693	29.350	4.724	123.79
353	985113.0	154400.	1500	125	4.0	15.6	15.2	707.	950.	.61	12.7	1.5	190.	192.	-1.02	3.853	33.770	2.171	123.79
354	985113.0	154404.	1500	126	4.0	15.6	15.3	705.	967.	.54	12.7	1.5	190.	193.	-1.02	3.828	33.450	2.161	123.79
355	985113.0	154409.	1500	126	4.0	15.6	15.2	703.	970.	.57	12.7	1.5	189.	193.	-1.02	3.842	32.990	2.206	123.79
356	985113.0	154429.	1500	125	4.0	15.6	15.1	704.	989.	.62	12.8	1.5	189.	193.	-1.01	3.825	32.600	2.168	123.79
357	985113.0	154433.	1500	125	4.1	15.5	15.1	704.	981.	.63	12.8	1.4	190.	192.	-1.01	3.825	32.330	2.175	123.79
358	985113.0	154437.	1500	125	4.1	15.5	15.1	703.	974.	.64	12.8	1.4	190.	192.	-1.02	3.836	32.460	2.219	123.79
359	985113.0	154441.	1500	125	4.2	15.5	15.0	701.	994.	.60	12.8	1.4	190.	192.	-1.02	3.832	32.320	2.219	123.79
360	985113.0	154455.	1500	125	4.2	15.5	15.1	705.	1009.	.61	12.7	1.4	191.	192.	-1.02	3.862	34.260	2.171	123.79
361	985113.0	154503.	1500	124	4.2	15.5	15.1	706.	997.	.64	12.8	1.4	191.	192.	-1.02	3.861	34.720	2.173	123.79
362	985113.0	154507.	1500	125	4.2	15.5	15.1	706.	999.	.66	12.7	1.4	190.	192.	-1.02	3.856	34.620	2.198	123.79
363	985113.0	154511.	1500	125	4.3	15.5	15.1	706.	1000.	.60	12.7	1.4	190.	192.	-1.02	3.842	34.520	2.226	123.79
364	985203.0	103344.	870	118	3.7	16.5	15.5	851.	1037.	.10	12.9	2.3	190.	186.	-.57	2.193	54.960	1.182	124.79
365	985203.0	103349.	870	119	3.7	16.5	15.5	850.	1037.	.11	12.8	2.3	190.	187.	-.57	2.189	55.420	1.228	124.79
366	985203.0	103353.	869	119	3.7	16.5	15.6	852.	1042.	.13	12.8	2.3	190.	186.	-.57	2.191	55.590	1.223	124.79
367	985203.0	103357.	870	120	3.7	16.4	15.5	854.	1044.	.13	12.8	2.3	190.	186.	-.57	2.195	55.020	1.216	124.79
368	985203.0	103401.	869	119	3.7	16.4	15.6	853.	1024.	.13	12.8	2.3	190.	186.	-.57	2.195	55.670	1.196	124.79
369	985203.0	103413.	868	119	3.7	16.4	15.5	851.	1037.	.12	12.9	2.3	190.	187.	-.57	2.179	55.120	1.207	124.79
370	985203.0	103417.	868	118	3.7	16.4	15.5	849.	1032.	.13	12.9	2.3	190.	186.	-.57	2.184	54.810	1.181	124.79
371	985203.0	103422.	870	119	3.7	16.4	15.5	851.	1025.	.13	12.9	2.2	190.	187.	-.57	2.185	55.350	1.212	124.79
372	985203.0	103427.	870	119	3.7	16.4	15.6	852.	1051.	.10	12.8	2.2	190.	186.	-.57	2.191	55.540	1.241	124.79
373	985203.0	103431.	870	119	3.6	16.4	15.5	851.	1037.	.11	12.9	2.3	190.	187.	-.57	2.187	55.490	1.238	124.79
374	985303.0	104036.	873	58	11.5	16.7	14.2	190.	3571.	.14	12.3	3.0	190.	186.	-.42	1.622	54.020	.882	124.79
375	985303.0	104041.	874	58	11.9	16.7	14.2	184.	3497.	.15	12.3	3.0	190.	186.	-.42	1.624	54.190	.905	124.79
376	985303.0	104045.	874	58	11.9	16.8	14.4	173.	3323.	.15	12.3	3.0	190.	186.	-.42	1.625	54.460	.895	124.79
377	985303.0	104049.	874	57	11.9	16.8	14.4	167.	3182.	.16	12.3	3.0	190.	186.	-.42	1.619	54.900	.896	124.79
378	985303.0	104053.	874	56	11.9	16.7	14.4	161.	3154.	.17	12.4	3.0	191.	186.	-.42	1.619	55.150	.898	124.79

TABLE B-1. CHRYSLER 225 CID TEST DATA (CONTD)

REC NUM	NOMINAL CODE	TIME HHMMSS	RPM RPM	CTORQ LB-FT	EGR %	A/FEX	D	A/FTC LB/HR	CNOX PPM	HC PPM	CO %	CO2 %	O2 %	COOLE DEG-F	EXOIL DEG-F	AIRDP INH2O	AIRFLO LB/MIN	ABSHUM GR/LB	FLO G/S	DATE JUL.YR
379	985383	8 105819.	874	78	10 2	16 6		15.0	430	1651.	.15	12 8	2.6	191.	185	-.46	1.754	53.200	.989	124.79
380	985383	8 105824	871	78	9 9	16 6		15.1	417	1458	.15	12 9	2 6	191.	185	-.46	1.755	53.320	.960	124.79
381	985383	8 105828.	873	78	9 8	16.6		15.2	485	1338	.15	12.9	2 6	190.	186	-.46	1.758	53.400	.992	124.79
382	985383	8 105831.	874	78	9 8	16 6		15.2	522	1423.	.15	12 9	2 6	190.	186	-.46	1.760	53.250	.991	124.79
383	985383.8	105835.	874	78	9.7	16.6		15 1	502	1519	.14	12 9	2 6	190.	186.	-.46	1.757	53.090	1.006	124.79
384	985383	8 105853.	872	78	9 8	16.6		15.8	530	1667	.13	12 9	2 6	190.	186	-.46	1.759	54.280	.960	124.79
385	985383	8 105857.	873	77	9 8	16.6		15 3	502	1400.	.12	12 8	2.6	190.	186	-.46	1.758	53.620	.952	124.79
386	985383	8 105101.	872	77	9 8	16.6		15.3	490	1391.	.12	12 8	2 6	190.	186	-.45	1.749	53.378	1.003	124.79
387	985383	8 105105	875	76	9 8	16.6		15.2	492	1380.	.15	12 8	2.6	190.	186	-.46	1.755	53.200	.981	124.79
388	985383	8 105108.	875	77	9 8	16.6		15.2	510.	1474.	.15	12 8	2 6	190	186	- 45	1.752	52.820	1.011	124.79
389	986084	8 131449.	1500	128	2 8	15.7		15.2	833	874	.39	12 9	1.5	193.	191	-1.05	4.054	51.260	2.198	124.79
390	986084	8 131452.	1500	128	2 8	15.7		15.3	833.	880	41	12 9	1.5	193.	191	-1.06	4 075	50.990	2.223	124.79
391	986084	8 131459.	1500	128	2 8	15.7		15.3	833	909.	.37	12.9	1.5	193.	191	-1.05	4.054	51.170	2.219	124.79
392	986084	8 131503	1500	128	2 8	15.7		15.2	834.	881.	.38	13 0	1 5	192.	191.	-1.06	4.065	51.470	2.220	124.79
393	986084	8 131507.	1500	128	2 8	15.7		15.3	833.	884.	.38	12 9	1 4	191.	191	-1.05	4 043	51.430	2.207	124.79
394	986084	8 131558.	1500	129	2.6	15.9		15.6	827	779	.31	12 8	1 7	193	191	-1.07	4 138	49.008	2.234	124.79
395	986084	8 131619.	1500	128	2 4	15.9		15 5	834.	798.	.30	12 8	1 7	190.	191	-1.07	4.120	50.750	2.182	124.79
396	986084	8 131622.	1500	128	2.4	15.9		15.6	835	790	.32	12 8	1 7	189.	191.	-1.07	4 098	50.970	2.198	124.79
397	986084	8 131628.	1500	127	2 5	15 9		15.6	833	771.	.31	12.8	1.6	188.	192.	-1.06	4.075	51.470	2.226	124.79
398	986084	8 131632.	1500	127	2.5	15.9		15.6	834.	776.	.30	12.8	1.6	188.	192.	-1.06	4.065	51.340	2.205	124.79
399	980385	8 132159	1000	121	3.7	16.4		15.9	838.	986.	.10	12 6	2.2	192.	189	-.67	2.561	51.660	1.298	124.79
400	980385	8 132203	1800	121	3 9	16.4		15.9	837.	969	11	12 6	2 2	191.	189.	-.67	2.562	51.140	1.297	124.79
401	980385	8 132227.	1000	121	4 1	16.5		16.0	834	934.	.09	12 5	2.3	190.	189	-.67	2.556	51.730	1.365	124.79
402	980385	8 132226.	1808	122	4 1	16.5		16.0	834	950.	11	12.6	2.3	190.	189.	-.67	2.565	51.410	1.396	124.79
403	980385	8 132231.	1000	122	4 1	16.5		16.0	834	960.	.09	12.6	2.3	190.	190.	- 67	2.564	51.420	1.331	124.79
404	980385	8 132254.	1808	121	4 1	16.5		15.9	835	972.	.10	12 6	2 3	189.	190.	-.67	2.562	52.038	1.403	124.79
405	980385	8 132257.	1000	121	4 1	16.5		15 9	835.	964.	.11	12 6	2 3	190.	190	-.66	2.524	51.670	1.346	124.79
406	980385	8 132301	1081	121	4.1	16.5		16.0	834	936.	.12	12.5	2 3	190.	190.	-.66	2 538	51.290	1.364	124.79
407	980385	8 132305.	1001	121	4 1	16.5		16 0	834	949	10	12 5	2 3	190.	189.	-.67	2.567	51.440	1.368	124.79
408	980385.8	132309.	1008	121	4 1	16 5		16.0	833	957.	.10	12 5	2.3	190	190	-.67	2 563	51 650	1.373	124.79
409	980485	8 133107	1000	79	8.1	17 8		16 0	550.	2679.	.10	11 3	3.9	190.	188	-.58	2.224	48.490	1.120	124.79
410	980485.0	133111.	1080	79	8.0	17.8		16.2	524.	2494.	.10	11.3	3.9	190.	188	-.58	2.226	48.150	1.101	124.79
411	980485.0	133122.	1000	82	8.0	17.8		16.3	559.	2405.	.10	11.2	3.9	190.	188.	-.59	2.265	47.660	1.095	124.79
412	980485.0	133127	999	83	7 9	17.8		16.2	538	2494	10	11 3	3 9	190.	188	-.59	2.269	47.510	1.114	124.79
413	980485.0	133131	1000	83	7 8	17.9		16.5	562	2168.	.10	11 3	3 9	190	188	-.59	2.268	47.430	1.118	124.79
414	980485.8	133135.	1008	82	7 7	17 9		16.8	592	1827	.10	11 3	3 9	190.	188	-.59	2.258	47.478	1.107	124.79
415	980485	8 133138.	1008	83	7 6	17.9		16 7	610.	1856.	10	11.4	3 9	190.	187	-.59	2.262	47.570	1.110	124.79
416	980485	8 133237.	1000	81	7 8	17.6		15 9	557	2679.	.11	11 4	3.8	190	188	-.59	2 253	49.280	1.076	124 79
417	980485	8 133240	1001	81	7 8	17.7		16.0	597	2573.	11	11.3	3.7	190.	188	-.59	2.252	48.950	1.118	124.79
418	980485	8 133244	1001	81	7 7	17.6		15.8	635	2800.	.11	11 4	3 7	190.	187	-.59	2.251	48.650	1.080	124.79
419	980485	8 133248	1002	81	7 8	17.7		16.0	615	2615.	.11	11.3	3 8	190	187.	-.59	2.260	49.080	1.164	124.79
420	980503	0 143727.	999	39	12 6	17 7		3.4	87	9832.	19	10 6	4.9	189.	185.	-.46	1.782	48 570	.877	124.79
421	980503.0	143731.	1000	40	12 7	17.8		4.7	85	8900.	19	10 5	4 9	189.	185	-.46	1.786	48.970	.941	124 79
422	980503	0 143740.	1000	39	12 7	17 9		4 6	77	8588.	20	10.6	5 0	189	185	- 46	1 765	48 700	.892	124 79
423	980503	0 143744	1000	39	12 6	17 9		4 6	82	8487	20	10.7	5 0	189.	185.	- 46	1.776	48 898	.844	124.79
424	980503	0 143749	997	39	12 8	17.8		3 8	85	8678	20	10 6	4 9	189	185	- 46	1 775	49.128	.879	124 79
425	980503	0 143802.	999	39	12 8	17 8		4 6	76	8680.	19	10 6	4 9	190.	185	- 46	1 768	48.820	.855	124 79
426	980503	8 143809.	1000	39	12 5	17 8		3 4	81	8792	20	10.6	4.9	189	185	- 46	1.780	49.120	.885	124 79
427	980503	0 143813.	1001	40	12.6	17.8		4 2	83	8685.	.20	10 6	4 9	190	185	- 46	1 767	49 270	.914	124.79
428	980503	0 143829	998	39	12 8	17 7		4 2	87.	8646	19	10 7	4 9	190.	185	- 46	1 766	49 050	.888	124 79
429	980503	0 143834	1000	39	12 7	17 6		1.8	83	9571	19	10.7	4 8	189	185	- 46	1 768	48.930	.926	124.79
430	980503	8 145718	1000	39	9 5	17 5		14 2	113	5140	20	11 1	4 8	190	186	-.45	1 715	46.450	.849	124 79
431	980503	0 145724	1000	39	9 5	17 4		13 2	119	5463	21	11 2	4 0	190	186	- 45	1 719	46 700	.874	124.79
432	980503	0 145728	998	39	9 6	17 4		13 0	113	5893	20	11 1	4 8	190	186	- 44	1 708	46 760	.867	124.79
433	980503	0 145734	998	39	9 6	17 5		14 1	107	5324	19	11 0	4 1	190	187	- 44	1 703	47 210	.850	124.79

TABLE B-1. CHRYSLER 225 CID TEST DATA (CONTD)

REC NUM	NOMINAL CODE	TIME HHMMSS	RPM	TORQ LB-FT	EGR %	A/FEX
434	980503.0	145738.	999	39	9.5	17.5
435	980503.8	150015.	1000	40	9.3	17.6
436	980503.8	150019.	999	39	9.4	17.5
437	980503.8	150023.	999	40	9.4	17.5
438	980503.8	150027.	1000	40	9.4	17.7
439	980503.8	150031.	1000	39	9.4	17.7
440	985402.8	155043.	875	39	8.6	16.5
441	985482.8	155047.	874	39	8.8	16.6
442	985482.8	155051.	873	39	8.8	16.5
443	985402.8	155055.	876	38	8.8	16.5
444	985482.8	155059.	876	39	8.9	16.4
445	985482.8	155183.	876	39	8.8	16.5
446	985402.8	155187.	876	40	8.8	16.6
447	985482.8	155111.	877	39	8.7	16.6
448	985482.8	155115.	876	39	8.8	16.5
449	985402.8	155119.	878	39	8.9	16.4
450	985984.8	93930.	888	139	1.0	13.8
451	985984.8	93935.	888	139	1.0	13.8
452	985984.8	93939.	888	139	1.0	13.8
453	985984.8	93943.	888	139	1.0	13.8
454	985984.8	93947.	888	139	1.0	13.8
455	985904.8	94826.	888	139	1.0	13.8
456	985984.8	94035.	888	139	1.0	13.8
457	985904.8	94039.	888	139	1.0	13.8
458	985904.8	94043.	888	139	1.0	13.8
459	985984.8	94047.	888	139	1.0	13.8
460	985585.8	94040.	888	3	.6	18.3
461	985584.8	94858.	878	4	.6	18.7
462	985584.8	94854.	877	4	.6	18.7
463	985584.8	94850.	879	3	.6	18.9
464	985585.8	94902.	888	4	.6	18.8
465	985584.8	94924.	888	4	.6	18.3
466	985584.8	94928.	888	4	.6	18.3
467	985585.8	94932.	879	4	.6	18.3
468	985585.8	94936.	879	3	.6	18.4
469	985585.8	94939.	888	4	.6	18.8
470	986285.8	95981.	750	38	.8	16.7
471	986285.8	95985.	750	38	.8	16.7
472	986284.8	95989.	750	37	.8	16.7
473	986284.8	188526.	749	39	2.4	16.7
474	986284.8	188530.	750	39	2.4	16.7
475	986284.8	188534.	750	39	2.4	16.6
476	986284.8	188609.	749	38	2.4	16.8
477	986284.8	188613.	749	38	2.4	16.8
478	986284.8	188617.	749	37	2.4	16.8
479	986284.8	188621.	749	37	2.4	16.7
480	986284.8	188625.	750	38	2.4	16.7
481	986284.8	188753.	750	39	2.4	16.6
482	986284.8	188757.	749	39	2.4	16.6
483	986284.8	188881.	749	39	2.4	16.6
484	986284.8	188806.	749	39	2.4	16.5
485	986284.8	188818.	749	39	2.4	16.6
486	986384.8	181332.	749	1	2.7	19.4
487	986384.8	181336.	748	1	2.7	19.7
488	986384.8	181340.	748	1	2.6	19.9

A/FTC LB/HR	CNOX PPM	HC PPM	CO %	CO2 %	O2 %	COOLE DEG-F	EXOIL DEG-F	AIRDP INH2O	AIRFLO LB/MIN	ABSHUM GR/LB	FLO G/S	DATE JUL.YR
13.4	107.	5838.	.19	11.1	4.1	190.	186.	-.45	1.714	47.518	.883	124.79
13.9	108.	5756.	.21	11.0	4.3	190.	186.	-.46	1.754	48.108	.934	124.79
13.0	103.	6111.	.20	11.0	4.2	190.	186.	-.46	1.756	48.230	.883	124.79
12.5	106.	6304.	.28	10.9	4.2	190.	186.	-.46	1.753	48.238	.861	124.79
13.8	117.	5396.	.20	10.9	4.2	190.	186.	-.45	1.744	48.348	.865	124.79
14.4	114.	5101.	.20	10.9	4.3	190.	186.	-.45	1.735	48.578	.887	124.79
14.1	167.	4406.	.25	11.7	2.9	189.	185.	-.36	1.403	45.850	.687	124.79
14.4	169.	3870.	.27	11.7	2.9	198.	185.	-.37	1.484	46.898	.676	124.79
14.0	154.	4388.	.30	11.8	2.9	189.	185.	-.36	1.400	46.370	.733	124.79
13.6	146.	4483.	.28	11.7	2.9	198.	185.	-.36	1.398	46.398	.775	124.79
13.0	141.	4944.	.29	11.7	2.9	189.	185.	-.36	1.399	46.480	.719	124.79
14.2	144.	4298.	.30	11.6	2.9	189.	185.	-.36	1.398	46.568	.718	124.79
14.4	142.	3916.	.27	11.7	3.0	189.	185.	-.36	1.396	46.560	.742	124.79
14.1	143.	4210.	.27	11.8	3.0	189.	185.	-.36	1.396	46.528	.718	124.79
13.9	145.	4534.	.27	11.8	2.9	189.	185.	-.36	1.396	46.508	.748	124.79
12.9	140.	4898.	.27	11.8	2.8	189.	185.	-.36	1.398	46.588	.822	124.79
13.7	712.	1571.	2.59	11.8	.3	191.	185.	-.59	2.431	15.888	1.515	127.79
13.7	713.	1594.	2.57	11.8	.3	198.	185.	-.59	2.416	15.728	1.518	127.79
13.7	713.	1583.	2.57	11.8	.3	190.	185.	-.59	2.424	15.748	1.507	127.79
13.7	713.	1594.	2.55	11.8	.3	198.	185.	-.59	2.439	15.768	1.528	127.79
13.7	713.	1585.	2.59	11.8	.3	190.	185.	-.59	2.436	15.858	1.513	127.79
13.7	713.	1587.	2.48	11.9	.3	189.	185.	-.59	2.425	16.058	1.515	127.79
13.7	711.	1587.	2.58	11.8	.3	189.	185.	-.59	2.430	15.838	1.513	127.79
13.7	711.	1583.	2.53	11.8	.3	189.	185.	-.59	2.426	15.738	1.503	127.79
13.7	712.	1568.	2.52	11.9	.3	189.	185.	-.59	2.421	15.718	1.516	127.79
13.7	712.	1578.	2.51	11.8	.3	189.	185.	-.59	2.413	15.728	1.528	127.79
5.9	65.	9649.	.25	10.2	5.6	189.	183.	-.18	.745	15.868	.385	127.79
3.9	58.	9431.	.25	10.1	6.0	189.	184.	-.18	.758	15.868	.397	127.79
5.1	55.	9137.	.26	10.2	6.0	189.	184.	-.18	.758	15.838	.410	127.79
8.9	58.	7932.	.24	10.1	5.9	189.	183.	-.18	.745	15.698	.408	127.79
8.6	57.	8162.	.25	10.2	5.9	189.	183.	-.18	.744	15.698	.382	127.79
6.8	63.	8655.	.28	10.3	5.5	191.	183.	-.18	.746	15.888	.483	127.79
4.3	64.	9532.	.27	10.4	5.6	191.	183.	-.18	.743	15.948	.401	127.79
4.7	62.	9631.	.24	10.2	5.6	192.	183.	-.18	.745	15.998	.418	127.79
6.2	61.	9427.	.24	10.2	5.7	192.	183.	-.18	.746	16.048	.430	127.79
9.3	59.	7794.	.26	10.2	5.8	193.	183.	-.18	.744	15.978	.418	127.79
15.5	364.	1860.	.86	11.5	3.2	194.	182.	-.22	.890	15.698	.508	127.79
15.6	368.	1872.	.78	11.5	3.1	194.	181.	-.22	.889	15.698	.499	127.79
15.6	376.	1882.	.79	11.5	3.1	194.	181.	-.22	.891	15.768	.527	127.79
15.6	319.	2002.	.46	11.7	2.9	198.	183.	-.23	.955	15.798	.579	127.79
15.5	294.	1998.	.58	11.7	3.0	198.	183.	-.23	.952	15.838	.558	127.79
15.2	291.	2278.	.64	11.7	3.0	198.	183.	-.23	.953	15.788	.561	127.79
15.7	262.	1857.	.49	11.7	3.0	189.	182.	-.23	.942	15.818	.548	127.79
15.8	263.	1846.	.48	11.7	2.9	189.	182.	-.23	.944	15.728	.536	127.79
15.7	269.	1862.	.49	11.7	3.0	189.	183.	-.23	.945	15.808	.532	127.79
15.6	267.	1885.	.56	11.7	3.0	189.	183.	-.23	.948	15.888	.556	127.79
15.6	278.	1873.	.56	11.7	2.9	189.	182.	-.23	.946	15.778	.547	127.79
15.6	389.	1825.	.54	11.8	2.8	189.	182.	-.23	.955	15.908	.548	127.79
15.6	310.	1802.	.57	11.7	2.8	189.	182.	-.23	.952	15.908	.543	127.79
15.6	297.	1794.	.68	11.7	2.8	190.	182.	-.23	.953	15.908	.551	127.79
15.3	268.	2268.	.56	11.8	2.8	191.	182.	-.23	.950	15.918	.551	127.79
15.5	269.	2114.	.55	11.7	2.8	191.	182.	-.23	.958	16.808	.543	127.79
1.0	27.	14300.	.29	9.0	7.3	189.	182.	-.16	.666	16.678	.363	127.79
1.8	26.	14060.	.24	9.8	7.5	189.	182.	-.16	.668	16.648	.356	127.79
1.0	25.	13600.	.26	9.0	7.7	188.	182.	-.16	.668	16.698	.350	127.79

TABLE B-1. CHRYSLER 225 CID TEST DATA (CONTD)

REC NUM	NOMINAL CODE	TIME HHMMSS	RPM RPM	CTORQ LB-FT	EGR %	A/FEX
489	986304.0	101348.	748	0	2.5	19.8
490	986304.0	101356.	748	1	2.5	19.7
491	986304.0	101400.	749	1	2.5	19.7
492	986304.0	101404.	748	1	2.5	19.8
493	986304.0	101408.	749	0	2.5	19.9
494	986304.0	101412.	747	0	2.5	19.8
495	986304.0	101416.	749	1	2.5	19.8

A/FTC LB/HR	CNOX PPM	HC PPM	CO %	CO2 %	O2 %	COOLE DEG-F	EXOIL DEG-F	AIRDP INH2O	AIRFLO LB/MIN	ABSHUM GR/LB	FLO G/S	DATE JUL.YR
1.8	25.13990.	.31	9.2	7.8	188.	182.	-.16	.665	16.540	.334	127.79
1.8	25.14670	28	9.1	7.7	188.	183.	-.16	.662	16.690	.363	127.79
1.8	24.14320.	.30	9.8	7.7	188.	183.	-.16	.660	16.690	.338	127.79
1.8	24.14270	.30	9.1	7.8	188.	183.	-.16	.660	16.770	.337	127.79
1.8	25.13830.	29	9.1	7.8	187.	182.	-.16	.661	16.730	.348	127.79
1.8	24.14030.	.29	9.2	7.7	188.	182.	-.16	.660	16.790	.424	127.79
1.8	23.13170.	.29	9.2	7.7	187.	182.	-.16	.659	16.780	.438	127.79

TABLE B-1. CHRYSLER 225 CID TEST DATA (CONTD)

NEGATIVE TORQUES

RPM	CTORQUE LB-FT	A/F EX	NOCONC PPM	NCCONC PPM	COCONC %	CO2CONC %	O2CONC %	COOL ETEMP DEG F	EXOIL TEMP DEG F	MASSAFLOW LBS/MIN	ABSHUM GR/LB
1588.	-25.38	17.47	21.39	1373E+05	.4831	6 390	4.641	186.7	198.3	.1633	44 24
1500.	-18.52	14.22	21 54	6136E+05	.3818	8 330	8.615	186.7	196.6	.3001	44 50
1500.	-4.990	17.13	53.25	8908.	.3354	11 22	4 544	187.3	197.6	.3298E-01	44.37
1000.8	-14.59	16.84	30.11	1193E+05	1.968	9 489	5 761	187.7	191.6	.1307	45 26
1000.0	-9.020	14.77	36.98	9695.	2.358	11.04	2 026	187.7	188.6	.1430	45.03
999.7	-3 385	18.11	40.98	2551.	.3722	11.16	4 630	186.3	186.7	.2254	45 10
2000.	-32.24	17.96	15.06	.1387E+05	.5570	5 505	4 809	187.1	212.3	.7381	49 11
2000.	-6 904	17.14	26.71	6841.	.3136	10 55	3.882	186.9	211.3	2.197	50 83
2500.	-28 79	19.83	14.60	.1269E+05	.5781	8 349	7.452	187.0	223.6	1.628	48 85
2500.	-10 48	17.87	38.88	4781.	.3858	11.00	3 538	187.4	226.4	2.615	49.76
3000.	-48.01	19.19	11 85	.1208E+05	2123	9 059	6.574	181.6	235.4	.5152	31 78
3000	-28 75	18.36	15.89	.1161E+05	.5196	9.268	5 973	181.8	234.2	1.768	30 82
3000.	-8.737	15.78	65 83	599 0	.1592	12.41	1 218	181.8	238.7	2.824	32 16
3598.	-.1599	15.39	137 1	13.52	8587E-01	13.04	.7054	182.8	267 4	4.159	37 45
3688.	-47 55	16.98	14 04	.1226E+05	.2578	7 215	3 813	182.1	257.1	.4427	38.73
3598.	-35.70	17.73	17 15	5557E+05	5372	9 551	13.35	182.6	256.1	2.064	37.91
3599.	-11.68	14.26	84 49	3112.	8761	12 95	1099	183.8	268.9	3.208	49.93
880 8	-10 65	16.74	22 62	.1081E+05	1.784	9 222	5 196	183.8	181.3	.4820	60 69
879 3	-1.916	18.18	26 46	9386.	3591	9 752	5 353	184.2	179.9	.5596	62.46
758 8	-7 432	18 26	15.74	1057E+05	.5782	9 312	5 742	184 8	178.0	4865	63.19
758 0	-1 487	19 08	21.45	9716.	.2916	9 190	6 136	182.5	177 7	.5181	62.38

TABLE B-2. CHRYSLER 225 CID REDUCED TEST DATA.

RPM	CORRECTED TORQUE (LB-FT)	EGR (PERCENT)	AIR-FUEL RATIO	FUEL FLOW (LB/HR)	NO_x (GM/HR)	HC (GM/HR)	CO (GM/HR)
1500.0000	91.1100	4.2380	14.5500	8.4289	69.1867	39.2258	686.3305
1999.0000	81.6800	7.1030	15.2400	10.5320	131.9446	16.8107	136.0610
1990.0000	79.8500	7.5470	15.9200	15.1055	124.8359	24.6058	177.1250
1989.0000	79.1900	7.5400	15.9200	14.9585	123.4420	23.9936	186.0913
1990.0000	79.1200	7.5970	15.9500	15.0771	124.6230	23.4302	176.8850
1991.0000	40.2900	9.3570	16.7900	11.3139	37.2201	27.8283	157.3556
2000.0000	3.3460	12.0400	17.5900	7.0232	3.7751	332.4959	193.3445
2000.0000	119.5000	4.8250	15.0000	19.8280	165.7340	71.1748	1465.7210
2000.0000	160.6000	0.9976	13.6000	27.1858	205.5910	118.0539	6238.5000
2500.0000	158.2000	1.0470	13.3900	35.0411	259.9935	130.5016	8933.9440
2500.0000	121.5000	3.8080	14.3400	27.0837	211.5436	92.7661	4152.3250
2500.0000	80.5500	5.6260	15.6700	20.1902	168.6080	35.2924	854.8100
2500.0000	41.5500	8.2210	16.1500	14.4669	58.2993	12.9810	399.8083
2500.0000	3.7170	10.1800	16.3100	8.7536	11.8017	26.0173	244.8221
1500.0000	162.0000	0.8006	13.5600	20.1991	148.9977	102.0168	5204.3940
1500.0000	162.4000	0.8134	13.5500	20.2399	150.1057	101.2744	5187.8840
1500.0000	160.0000	0.8438	13.5600	20.0398	148.4430	102.0220	5134.4290
1500.0000	82.2700	8.3300	16.2200	11.8150	100.5981	29.2460	140.5908
1500.0000	42.2800	11.3100	17.4300	9.3735	13.5025	100.6733	157.8411
1500.0000	2.3350	16.8000	17.0200	5.4645	1.2458	305.1661	205.4782
3000.0000	157.7000	0.6564	13.2300	44.6340	326.1479	122.0923	10519.8000
3000.0000	117.8000	3.5820	14.0700	33.5565	252.0818	88.0748	4827.4880
3000.0000	79.3400	4.6730	15.1000	24.8920	201.9402	2.5896	83.6903
3000.0000	41.8900	6.0650	16.2600	18.7897	109.1072	1.7515	57.7814
3000.0000	42.0400	6.4660	16.1100	17.5866	117.0835	1.2089	102.1009
3000.0000	5.0030	7.5700	15.6900	11.7130	19.8529	7.6150	273.0031
3599.0000	140.2000	1.4180	13.4900	48.6583	344.5222	142.8138	10944.8900
3500.0000	107.2000	3.9090	13.8000	38.2174	278.4396	116.7285	7376.8800
3500.0000	68.9900	4.4230	15.5300	27.9910	220.5550	5.0885	352.3588
3500.0000	37.2400	5.3790	16.0600	20.7049	158.0968	1.3957	85.6615
3000.0000	120.6000	3.9220	14.2900	32.2753	239.7846	102.3202	5494.7440
3000.0000	121.9000	3.9410	14.1700	32.4051	239.1913	104.9148	5665.2310
1500.0000	125.7000	4.2790	15.5000	18.9723	122.6022	52.8015	722.9702
870.0000	119.2000	3.6480	16.4400	7.9818	83.8868	30.9140	68.4523
875.0000	77.2500	9.7560	16.6100	6.3287	40.2641	35.0669	73.4412
1500.0000	127.6000	2.4750	15.8900	15.3493	153.0921	42.9497	338.5929
1000.0000	121.9000	4.1410	16.5000	9.3200	96.2447	33.3085	70.9255
1002.0000	81.2400	7.8010	17.6500	7.5784	62.4104	79.9790	68.3574
1000.0000	39.6800	9.3520	17.7200	5.8747	8.8993	119.7493	93.4668
878.0000	30.3700	8.8500	16.4000	7.1146	8.8019	93.0481	104.5556
880.0000	139.1000	1.0160	13.7900	10.4089	78.2996	52.0330	1693.0920
880.0000	2.8500	0.5953	18.0900	2.4443	2.1818	97.1161	49.9893
879.0000	3.6900	0.6088	18.9600	2.3717	1.9219	79.7524	46.3341
880.0000	4.5930	0.6023	18.7800	2.3764	1.8882	81.8954	51.5970
880.0000	4.8090	0.6076	18.2300	2.4421	2.1268	85.7021	55.0757
880.0000	4.3270	0.6105	18.7700	2.3780	1.9725	78.2471	52.8626
750.0000	38.2600	0.8110	16.7400	3.1878	14.7257	22.5984	180.0836
749.3000	39.6700	2.4470	16.5600	3.4021	11.5316	27.2930	142.2482
749.3000	1.5320	2.4720	19.8500	1.9931	0.6864	116.8305	51.9936

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